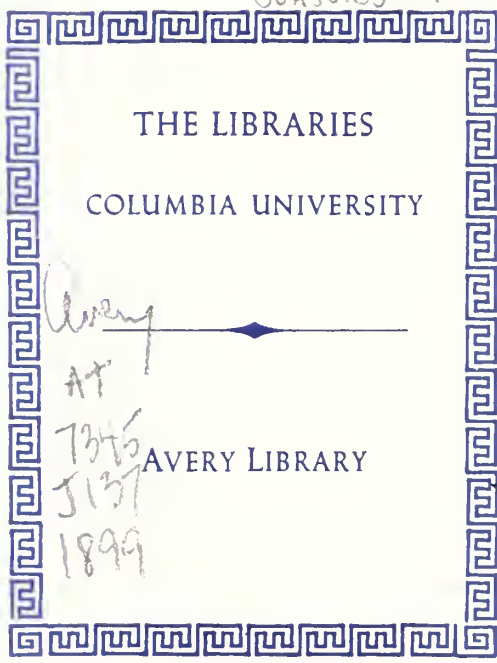


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IMPROVEMENT

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BUILDING CONSTRUCTION

153178



FOURTH SERIES

G 9846 a . . . 1899 . . .



Including an Inexpensive Method of Directing Daylight
Back into Dark Interiors or Rooms

. . . BY . . .

PETER H. JACKSON

PACIFIC COAST AGENTS

BAKER IRON WORKS,	- - -	950-966 Buena Vista Street
		Los Angeles, Cal.
CHAS. A. PALM,	- - - - -	1119 Sixth Street
		Sacramento, Cal.
C. H. BROWN & Co.,	- - - - -	76 First Street
		Portland, Oregon
C. H. BROWN & Co.,	- - - - -	322 Bailey Building
		Seattle, Wash.

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JACKSON'S COMBINED ARTIFICIAL STONE SIDEWALK

AND

GALVANIZED STEEL ROOF OF VAULT CONSTRUCTION

TOGETHER BUT 4 INCHES IN THICKNESS

The bottom surface of sidewalk forming a finished Galvanized Steel Ceiling to the room or vault beneath which, as to finish would be suitable for any ceiling of the building

The dove-tail corrugations in the steel bottom form retaining channels which hold and clasp the superposed Artificial Stone filling forming the sidewalk and becomes integral with it, and together of great strength.

It was found from trials of strength of several slabs, each 4 inches thick, 7 feet long, span 6 feet 6 inches, and 1 foot 8 inches wide, the average breaking distributed load was 2221 pounds per square foot. The San Francisco City Ordinance requires the strength of sidewalks over vaults to be 400 pounds per square foot, *or less than one-fifth this strength.*

ADVANTAGES

It increases the room from floor to ceiling from 12 to 15 inches compared to any other construction and without additional expense. It saves in cost by using lighter steel beams than when the usual heavy brick or concrete arches are used.

In many of the streets in San Francisco the street sewer is not deep enough for requisite height of closets, etc., under sidewalk. This construction admits from 12 to 15 inches more room up from the floor than the common method.

It is particularly adapted to places that will not admit of deep excavation before coming to water.

This galvanized steel ceiling or metal bottom of sidewalk, is the same as the galvanized steel bottoms of our Patent Sidewalk Lights, which we have made over 140,000 feet during the last ten years, and are in use in all the Cities of the United States on the Pacific Coast, and in a great many damp and exposed places, *and we have yet to learn of a single case of rust.*

THE FOLLOWING BUILDINGS IN SAN FRANCISCO AND OAKLAND, CAL., HAVE THIS IMPROVEMENT :

1140 to 1146 Market Street	Smith's Cash Store, 23 to 27 Market Street
32 Kearny Street	415 to 423 California Street
224 to 234 Powell Street	31 to 37 Turk Street
314 to 320 Mason Street	20 to 24 Geary Street
111 to 123 Third Street and extending down Stevenson Street	Stockton St., between Clay and Sacramento Sts.
S. W. corner Kearny and Commercial Sts.	175 feet long on Stevenson Street, beginning at 5th Street
Hall of Justice, Kearny Street	S. E. cor. Montgomery and Sutter Streets
122 to 128 Morton Street, and others.	

To be at new fire-proof building N. W. corner Kearny and California streets.

" " " Oberon Concert Hall Building, O'Farrell street.

" " buildings on Fourth and Morrison streets, Portland, Oregon.

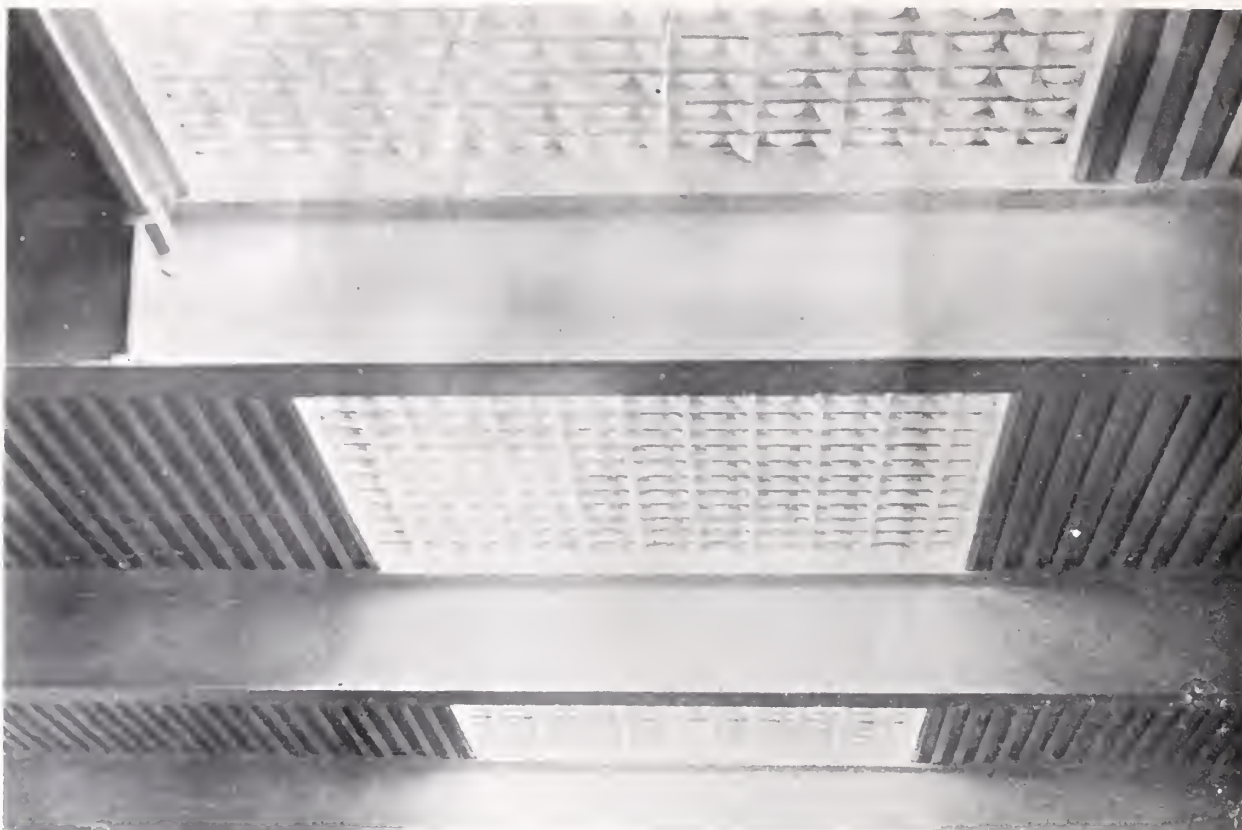
" " building, N. W. corner 2d and Minna Sts., San Francisco.

OAKLAND, CAL.

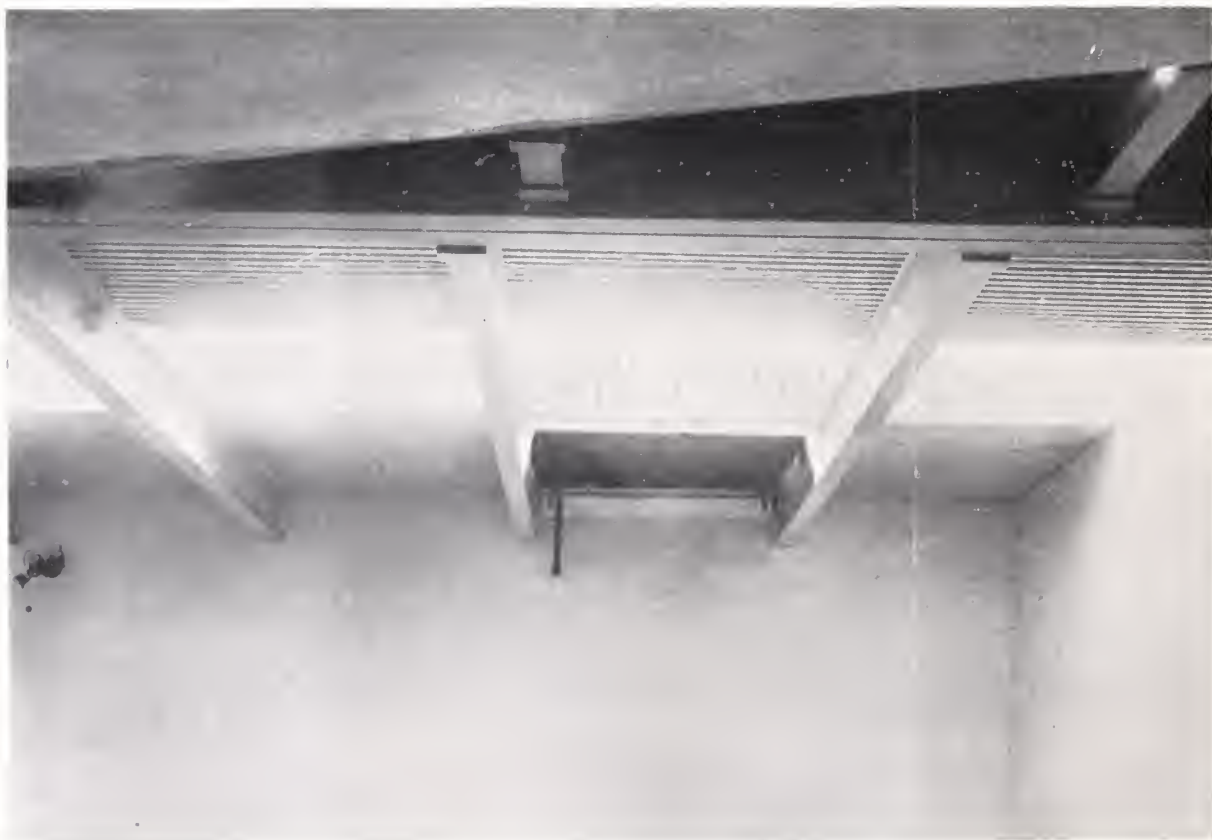
Oakland Bank of Savings in part, 416 to 420 Twelfth street, Uhl building, 13th street near Clay, and others.

To realize the advantage and finish of this improved construction it should be viewed from beneath.

P. H. JACKSON & CO., 228 & 230 First St., San Francisco, Cal.



From photo taken under sidewalk, from daylight through sidewalk lights of building 1140 to 1146 Market Street, San Francisco, Cal , showing the finished Galvanized Steel Ceiling and Reflecting Lens Sidewalk Lights. The thickness of combined sidewalk and vault roof 4 inches. Strength of sidewalk over 2000 pounds per square foot. Specification on 5th page.



From photo taken under 1st floor or basement of above building 25 feet distant back from the sidewalk lights from daylight coming through said lights at that distance, showing in the distance the finished Galvanized Steel Ceiling and Reflecting Lens Sidewalk Lights, and *No Leak to Basement*, flush steel sidewalk doors. The gutters in frame being steel never break from impact of boxes etc., passing through common to brittle to cast iron.

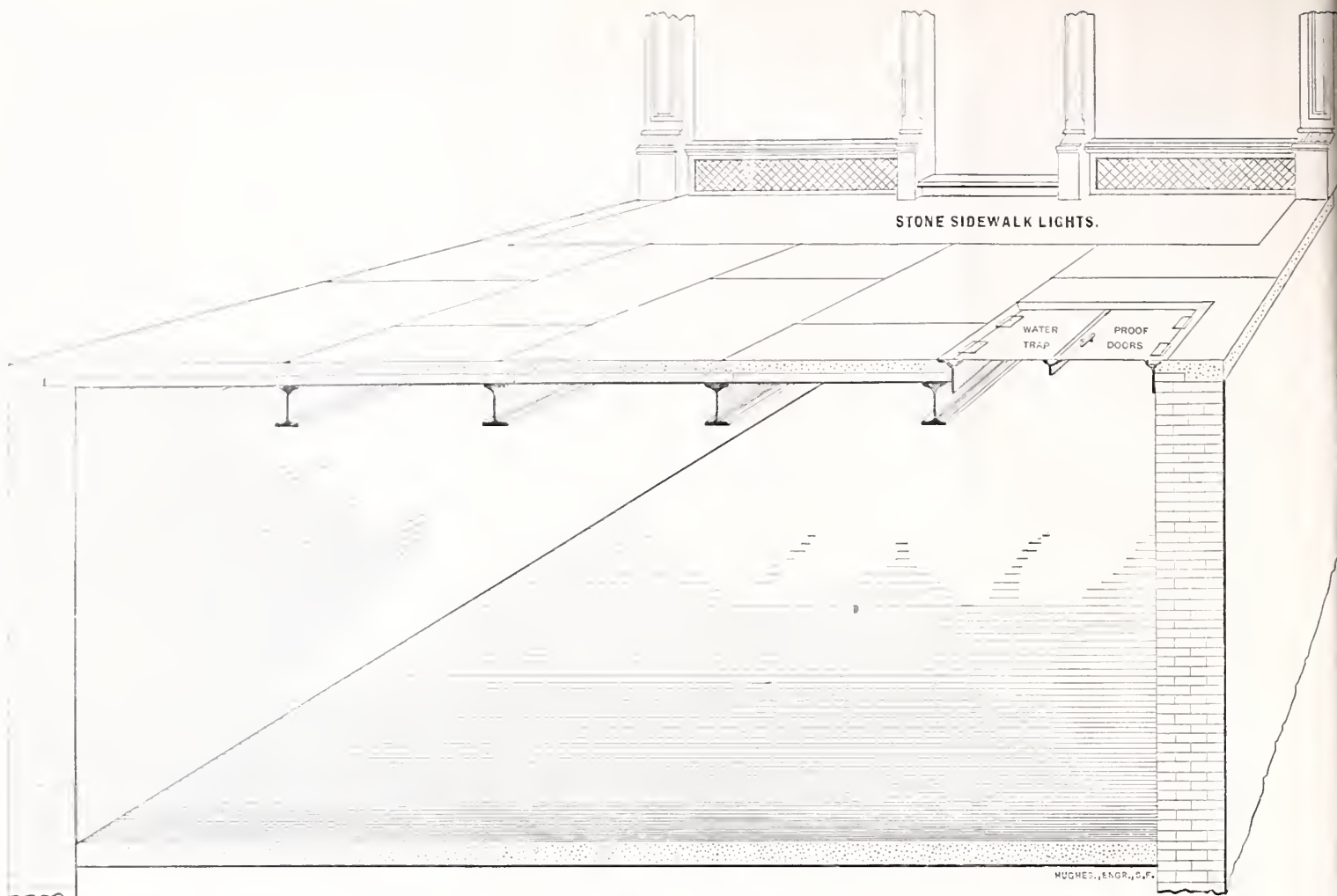


153178

From photo taken under sidewalk of building S. W. corner Kearny and Commercial Streets, San Francisco, Cal., from daylight through sidewalk lights above, showing finished Galvanized Steel Ceiling and Sidewalk Lights. The thickness of combined sidewalk and vault roof 4 inches. Strength of sidewalk, over 2000 pounds per square foot.



From photo taken under sidewalk of the then unfinished building S. E. corner Montgomery and Sutter Streets, San Francisco, Cal., belonging to the Luning Estate, from daylight coming through sidewalk lights above, showing the finished Galvanized Steel Ceiling and Sidewalk Lights supported by Jackson's Patent Concrete Beams. The thickness of Combined Sidewalk and Roof of Vault 4 inches. Strength of sidewalk over 2000 pounds per square foot. Specification on 5th page.



Outer end view of Combined Sidewalk and Roof of Vault Construction omitting retaining wall.



From photo taken under sidewalk of the Kearny Street front of the unfinished Hall of Just Building, San Francisco, Cal., Mess. Shea & Shea, Architects; showing bottom surface of sidewalk a finish Galvanized Steel Ceiling. The thickness of Combined Sidewalk and Vault Roof, 4 inches. This construction extends the length of block on Kearny Street and down Washington Street. Strength of sidewalk over 2000 pounds per square foot. Specification on 5th page.

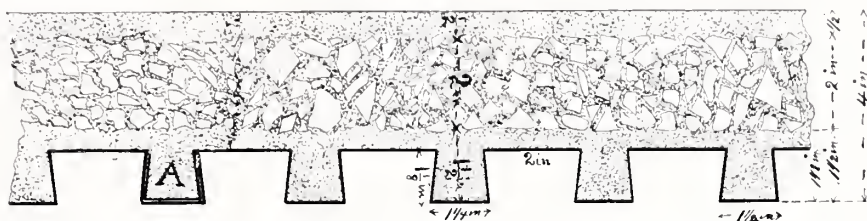
SPECIFICATION

OF

Jackson's Combined Artificial Stone Sidewalk and Galvanized Steel Ceiling of Basement Extension or Vault Beneath

Furnish and Set Artificial Stone Sidewalk with galvanized corrugated steel bottom forming finished ceiling to the room or vault beneath, together 4 inches in thickness, composed as follows:

The bottoms to be No. 22 Apollo Best Bloom, or other equally as good galvanized sheet steel having dove-tailed corrugations forming retaining channels for the superposed cement filling, and made as follows:



The corrugated sides of one sheet lapping into the adjoining one as shown at (A), see above cross section, and the ends of the corrugated sheets over the beams extending and lapping into each other $3\frac{1}{2}$ inches or more, the lap covering the width of the beam, the top piece overlapping in direction of the incline of the street.

The middle of spaces between beams to support the middle of the corrugated sheets to prevent vibration during tamping of the cement filling, to be temporarily braced in cross direction to the corrugations, the braces not to be removed before 9 days after completion of cement filling.

The corrugated steel bottoms to have a superposed thickness of 4 inches, composed as follows shown in above cross sections: the proportions described in measures, to be first quality slow setting Portland Cement, to be thoroughly mixed with its aggregates and proper proportion of water, worked quickly, and to be gently but thoroughly tamped, and not stopping work in any event until the full thickness of 4 inches is formed.

The bottom thickness to be $1\frac{1}{2}$ inches completely filling the corrugations $1\frac{1}{2}$ inches deep and $\frac{3}{4}$ of an inch over the flat portion between corrugations to be 1 of Portland Cement, $2\frac{1}{2}$ of clean sharp sifted beach gravel well mixed with water; if this surface is not very moist before next mixture is applied, coat it with a solution of neat Portland Cement and water of a consistence of very thick cream, upon this to a thickness of 2 inches to be quickly added a mixture of 1 part Portland Cement, 3 parts of clean sharp sifted beach gravel, 4 parts of clean small broken blue rock that will pass through a $\frac{3}{4}$ inch mesh, No. 3 rock, and water. (Red Rock Prohibited.)

The top half-inch to be equal parts Dyckerhoff or other equally as good Portland Cement and clean sharp sifted beach gravel; the top finished with neat Portland Cement colored to suit, and trowel finished laid off in squares not to exceed two feet, the incisions forming the squares in all cases to be $\frac{1}{2}$ inch in depth.

Two galvanized wires twisted into one to be laid about 1 inch below the finished top surface direct and across and not to exceed 20 inches apart in either direction.

The top surface to be covered after 20 hours old to a thickness of about one inch with clean sand, and then covered with boards for ten days, and to be kept continually wet during that time.

The spaces beneath, between the corrugations in steel ceiling directly over the beams, to be filled in the full width of flange of beam of a mixture of 3 gravel and 1 cement, and troweled smoothly. If any of the laps beneath are found open, to be filled and pressed in with India Rubber Cement.

The temporary braces beneath, to be removed not less than 9 days after completion of sidewalk.

The steel ceiling to have two coats of best white paint.

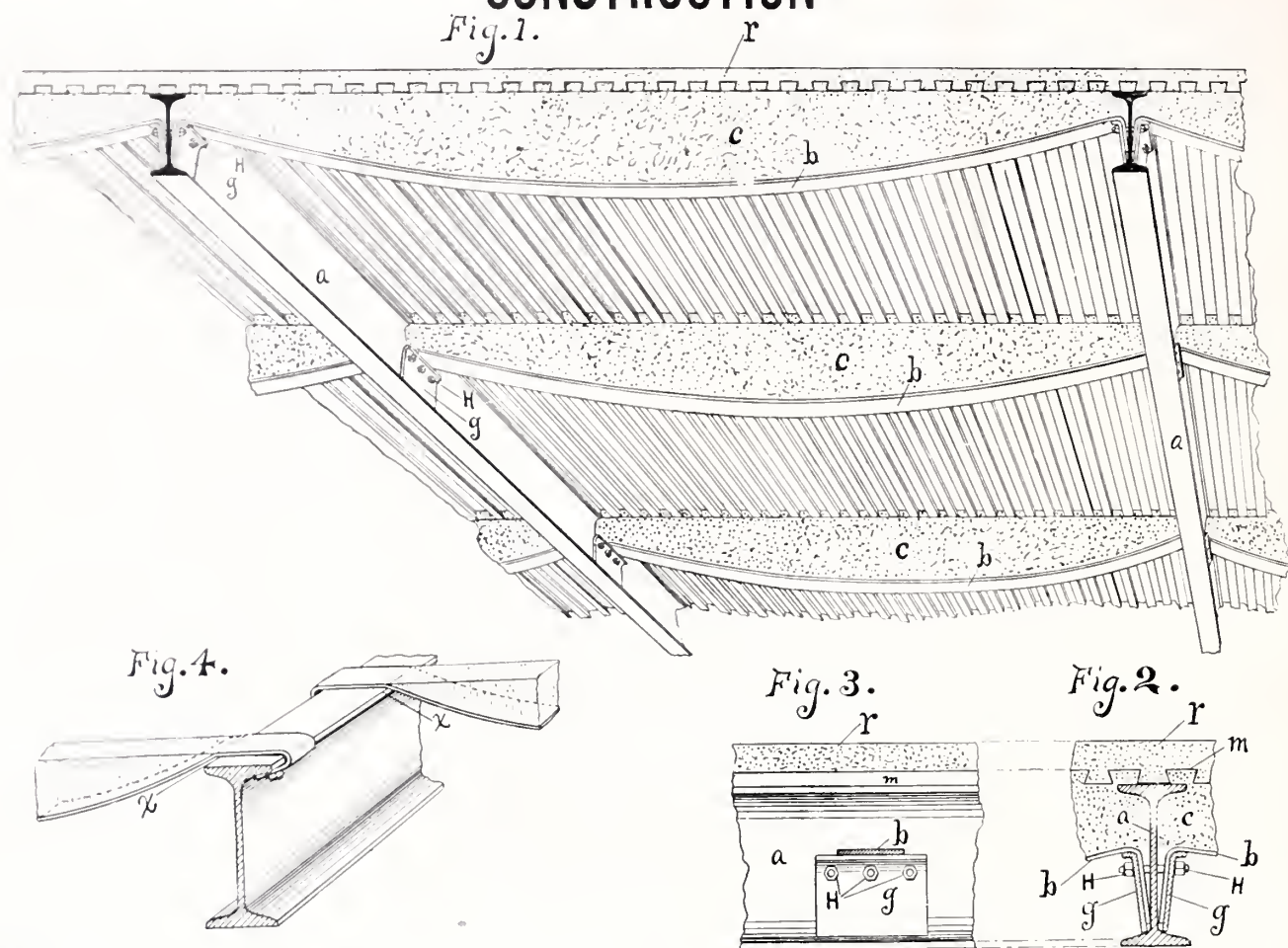
The sidewalk lights to have galvanized steel bottoms with dovetailed corrugations blocked with $2\frac{1}{2}$ inch diameter lenses, and artificial stone filling to be equal parts Portland Cement and fine sifted beach gravel, surface neat cement, bottom painted 2 coats of white paint.

For ventilation, large basement ventilators with suspended enameled non-corrosive dripping pans to be built in sidewalk near retaining walls and to be not over ten feet centers.

Jackson's No Leak to Basement, flush with sidewalk, all steel frame sidewalk doors with steel surrounding and steel middle gutters, with drain pipe to extend through retaining wall, and to have chains and fastenings complete.

SOLIDITY IN FIRE-PROOF BUILDINGS

JACKSON'S 1899 PATENT IMPROVED STRUCTURAL FIRE-PROOF CONSTRUCTION



THE sidewalls of a building having this light in weight, but strong and solid fire-proof construction between, are firmly held by the structural parts in their relative positions to each other by being both braced and tied throughout the distance between, stiffening the building in cross direction.

The ends of the light concrete beams or bearers (C) usually about seven feet from center to center, abut and press against the webs of the steel supporting beams (A, A), the metal strip ties (B), which support the concrete bearers, are attached to the sides of the steel beams about the middle of their depth, supported upon the clamps (G.)

An especial feature of this improvement after the concrete bearers (C) are hard and strong, by screwing up the nuts (H, H, H), better shown in figures 2 and 3, takes up any slack including shrinkage of the concrete, firmly tying and bracing the structural parts from wall to wall.

The steel I beams may be from 16 to 20 feet from center to center, and the concrete bearers 7 feet from centers.

Figure 4 shows the common method of this kind of construction, and is presented in contrast to the foregoing.

The strip ties Figure 4, hook over the top flanges of the steel beams, are roughly made common to blacksmith work not closely fitting the top and edges of the flanges and are not always of exact lengths, and when these ties are subjected to tensile strain during employment the inaccuracies of the tie stretch according to the strain, also the steel I beams are not braced.

On top of the steel beams and concrete bearers, see Figures 1, 2 and 3, are shown the fire-proof concrete floor with galvanized corrugated steel bottoms, having dovetailed corrugations which form retaining channels and hold and clasp the imposed fire-proof concrete filling which becomes integral with it.

The corrugated steel bottom of the floor resists the tensile strain during employment as the bottom flange of a steel beam.

The floor usually 3 ins. in thickness, requires no centers in formation, is of great strength fully 1500 pounds per square foot of 7 foot span, and if made 4 ins. thick fully 2000 pounds per square foot.

For floors of less strength expanded metal or wire netting enclosed in the fire-proof concrete may be used. Wooden strips may be built in the top of the concrete to nail wooden floor.

Rods attached to the bottom of the concrete bearers and steel beams are commonly used, hang down and hold the suspended fire-proof ceiling of the room beneath, leaving an air space between. The fire-proof ceiling may be either expanded metal, or wire netting, enclosed in fire-proof cement or asbestos, terra cotta, or any other fire-proof ceiling.

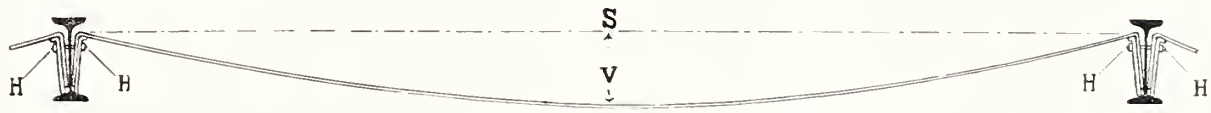
HOW TO COMPUTE THE SIZE OF STRIP TIE AND BOLTS OF END FASTENING.

To find the load which a metal strip tie has to sustain in its maximum employment, and what size it should be for such service, also the diameter and number of bolts to be used to fasten each end of tie:

First, find the area of floor surface to be carried by each strip tie, by multiplying the distance from centers of steel beams by the distance in the opposite direction from center of one tie to the next one.

For instance, suppose the distance from center to center of steel beams is 15 feet, and the distance across from centers of metal strips is 6 feet, and the weight of floor and employed imposed load together is 260 pounds per square foot, we have,

15 feet x 6 feet=90 feet x 260 pounds=23,400 pounds or 11 7-10 tons load. Employ the tie at 6 tons per square inch. Suppose the versed sine V to be 1 foot 3 inches.



Formula for computing the tensile strain on metal tie strip, which is as a Catenary of a suspension bridge :

W=total load found 11 7-10 tons.

T=tension on tie strip.

S=span in feet. 15 feet.

V=versed sine 1 foot 3 inches.

$$T = \frac{WS}{8V} = \frac{175.5}{10} = 17 \text{ 5-10 net tons employed tensile strain on tie.}$$

Employing the tie in proportion of 6 tons tension to 1 inch of its cross section, makes the requirement 3 square inches, therefore a tie 6 inches wide by 1/2 inch thick is suitable.

The end attachments of ties to web of steel beams should be nearer the top flange than shown in cuts on page 6, in order that the Versed Sine, V, may be as great as the case may admit, which reduces the required amount of metal in tie and consequently reduces cost.

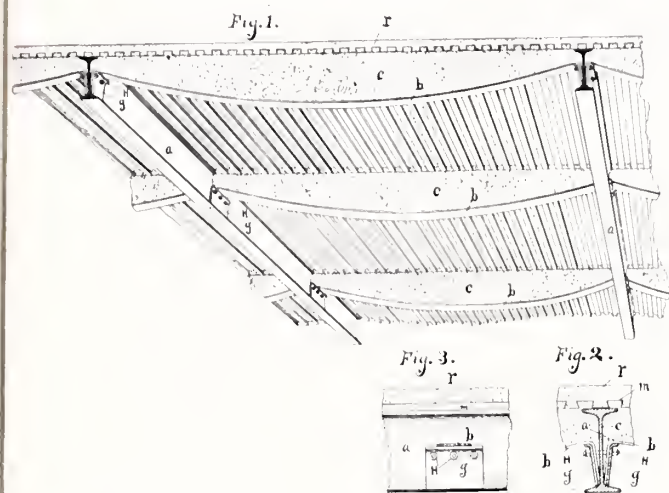
The screw bolts and nuts, H, at each end extending through clamp and tie, is subjected to the same tensile strain as the tie, and in this instance would require as indicated below 4 bolts 1 1/8 inch diameter employed at 4 1/2 tons each=18 tons.

After the required tensile strain on tie is found in any case, employ bolts H, of the following diameters up to the number of tons given:

3/4	inch diameter bolt to be employed up to	1 9-10	net tons.
7/8	" " " " " "	2 7-10	"
1	" " " " " "	3 8-10	"
1 1/8	" " " " " "	4 5-10	"
1 1/4	" " " " " "	5 75-100	"

SPECIFICATION OF FIRE-PROOF FLOORS OF JACKSON'S SYSTEM

All floors excepting basement to be of galvanized sheet steel having dove-tail corrugations forming retaining channels, Cinder Concrete, Suspension Steel Straps, supporting clamps and bolts, as illustrated in Figures 1, 2 and 3, made according to plans herewith accompanying this specification.



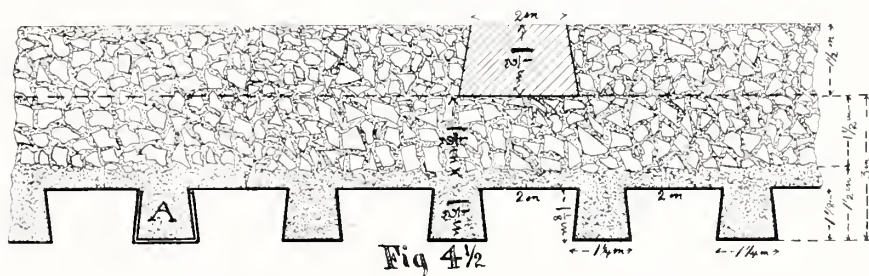
Said system to consist of Suspension Steel Straps B, about 7 feet centers of form shown, supported at ends by metal clamps, (G), and secured by 3 of $\frac{3}{4}$ in. diameter tightening bolts and nuts (H) extending through clamps straps and web of steel beam; the bolt holes in clamps to be about one-third its depth from the top.

The contractor furnishing the steel beams will furnish them ready punched through webs corresponding to holes in clamps; a templet and directions for the holes to be furnished that contractor.

The small V shaped open spaces between clamps and webs of steel beam to be temporarily filled before the concrete is added either with wet sand or

small strips of wood, and to be dug out clean after the concrete is hard and strong. Then place a board on each side of Suspension Steel Strap, with suspension ties between to support fire-proof floor, and fill in between and tamp to the level of top of steel beams with concrete material as next hereafter described. After the concrete has become hard and strong and the V shaped openings clear, tighten the screw bolts (H).

Then place No. 22 dove-tail galvanized corrugated steel sheets to form floor, each of a length extending over and resting on the concrete bearers, of form and size corrugations, etc., shown in the following section Figure 4 $\frac{1}{2}$. The sides of the corrugations lapping into each other one full corrugation as shown at (A), and the ends of the corrugated sheets extending into each other one or more inches.



In the middle of all corrugated sheets and directly beneath them, crossing the corrugations, to be a temporary stiff wooden brace extending their length to stiffen the middle of the corrugated sheet during tamping of the concrete.

The concrete mixture to completely fill the corrugations and $\frac{3}{4}$ of an inch above covering the flat surface between corrugations, making a thickness of $1\frac{1}{2}$ inches from bottom of metal as shown in Figure 4 $\frac{1}{2}$, and to be a mixture of 1 measure Portland Cement, $2\frac{1}{2}$ measures of sand, and requisite quantity of water, and to this is to be immediately added a mixture $1\frac{1}{2}$ inches in thickness composed of 1 measure of Portland Cement, 2 measures of clean, sharp beach gravel, and 5 measures of cinders, all to be thoroughly mixed and manipulated during the process of the work, and to be thoroughly tamped.

This concrete slab is now 3 inches in thickness, and after 8 days old, beveled wooden strips $1\frac{1}{2}$ inches in thickness shown in Fig. 4 $\frac{1}{2}$, and 18 inch centers, are to be placed by carpenter contractor, after which a concrete filling composed of 1 measure Portland Cement, 3 measures of sand, and 8 measures of cinders, to be filled in even with the top of wooden strips and thoroughly tamped in place. The wooden braces and boards at sides of bearers to be removed 9 days after the concrete filling has been completed.

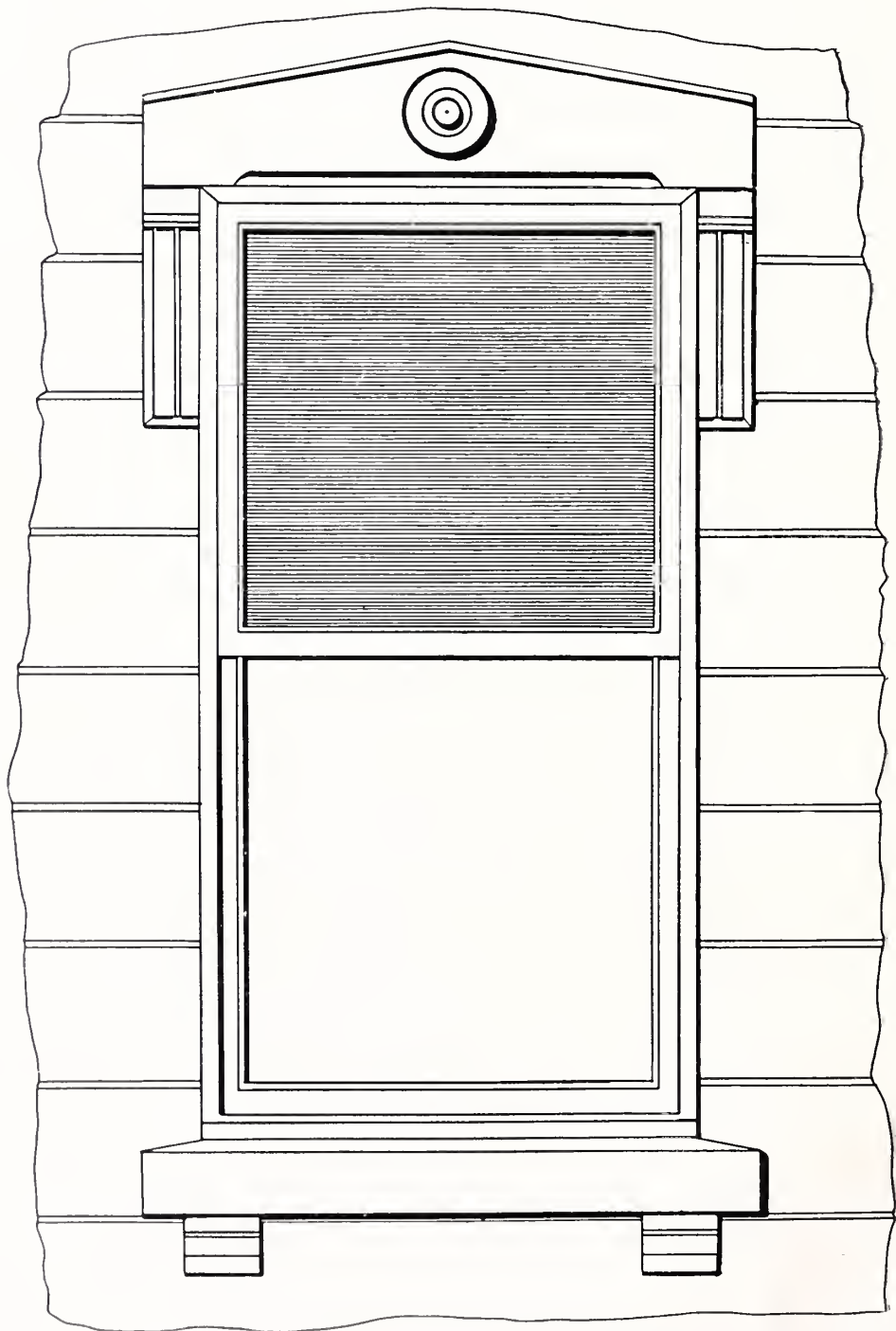
FIRE-PROOF CEILINGS

Under all floors and galleries, soffits of stairs, and under all roof rafters, to be formed a ceiling with cove corners, formed of 1 inch x 1 inch x $\frac{1}{8}$ inch steel bent to radius of cove corners, suspended by means of hook bolts spaced 14 inches centers, to which either expanded metal, or wire lathing imbedded in cinder concrete, securely wired; all ceilings to be ready for plaster.

A VALUABLE DISCOVERY

DIFFUSION OF LIGHT THROUGH WINDOWS AND TRANSMISSION OF LIGHT IN DARK PLACES.

The upper sashes of all deep rooms not well lighted at a distance back from the windows, should have simple ribbed glass in true curves, inverse and obverse 21 ribs to the inch. This form of glass is largely in commercial use for certain purposes, and is also the cheapest type of glass for glazing windows except the common clear glass, and is to be had in this market.



A window with ribbed glass in upper sash, and plain glass in lower sash.

The ribbed portion on inside and is easily kept clean.

Abstract from the Engineering News and American Railway Journal of Dec. 22, 1898, and substantiated by circular No. 72 of the Boston Manufacturers Mutual Fire Insurance Co., one of which we have.

Mr. Edward Atkinson, president of the Boston Manufacturers Mutual Fire Insurance Company, experimented largely on the best means of diffusion of light through windows and skylights in mills and factories.

He experimented with various forms of glass, including prismatic, corrugated, rough, waved, and ribbed glass, photographed images from each kind, also from plain glass, and he found that the greatest and most uniform diffusion of light *was not delivered from prismatic or angular forms* but from simple ribbed glass in true curves, inverse and obverse 21 ribs to the inch. This form of glass was fortunately in commercial use, and is also the cheapest for windows except the common clear glass.

Mr. Atkinson desired further information; again in 1898, Prof. C. L. Norton of the Massachusetts Institute of Technology, Boston, Mass., made a more complete investigation, and the report was made in July 19, 1898, by circular 72 of the Boston Manufacturers Mutual Fire Insurance Co., is as follows:

Mr. Norton started out doubting the assertion made, that more light was admitted in a room when glazed with corrugated glass than glazed with plain glass. But experience has clearly shown that, at the rear wall of a room 25 feet deep the light was increased three times by substituting ribbed glass for plain glass.

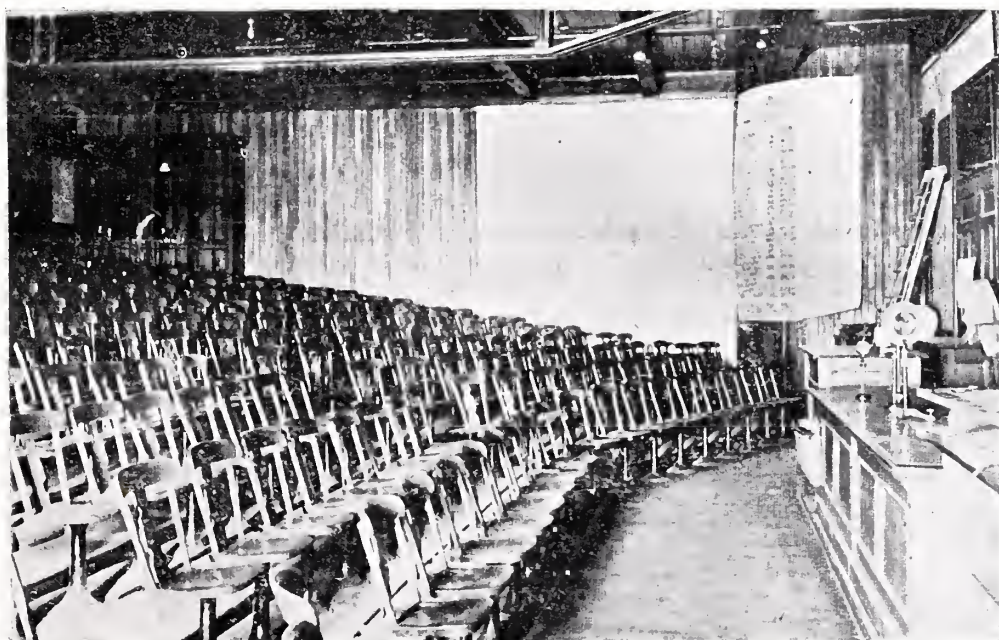
The result of this examination to determine the relative intensity of illumination in a room of the various glasses, of which he tested many kinds, in fact all he could find, including the *most expensive Cathedral Glass*, and the *Luxfer Prism Glass*, proved that the *cheap Factory Ribbed Glass* about 3-16 of an inch thick with 21 ribs to the inch, known as *Factory Glass* is *decidedly the best dispersive glass upon the market*. There is no apparent gain by corrugating both sides.

Ground glass is a loss of transparency caused by a slight amount of moisture or dust.

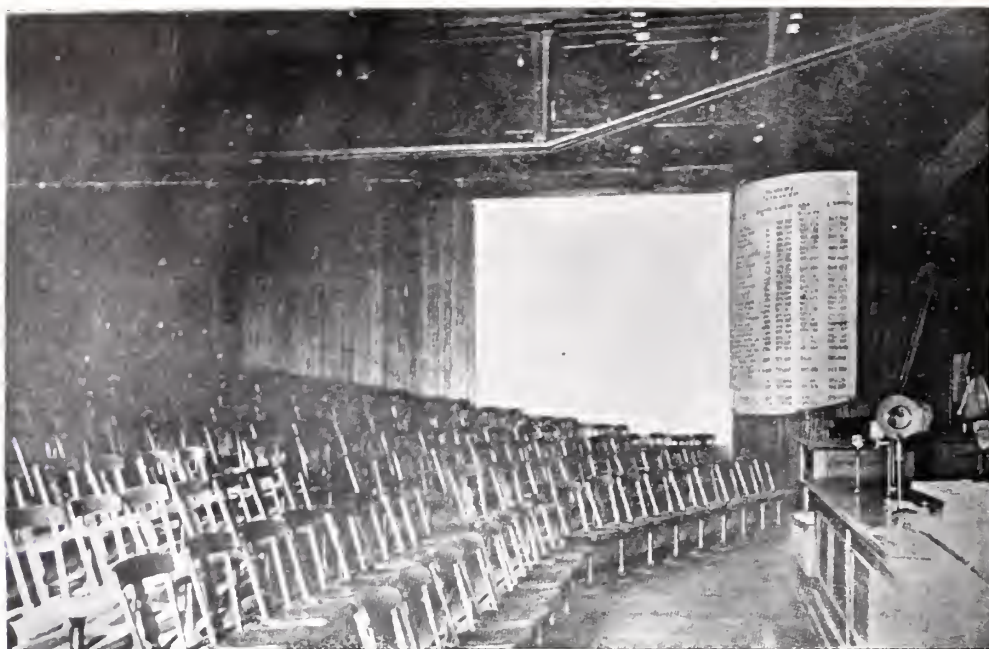
Photometric measurements were made by taking two rooms one above the other, alike in exposure, shape and size, and comparing the intensity of light falling on similar portions of the two, when one was glazed with plain glass and the other with glass under examination.

These following two photographs *do not show* as great a difference as does the eye. Take for instance the apparatus case in the upper right hand corner, where ribbed glass is used it is possible to distinguish and recognize the separate pieces with a very small window.

When the same window of plain glass is used, one cannot even see that there is any case there. In the photograph the windows are behind the camera, as is shown by the strong light on the lower corner of the plain exposure.



RIBBED GLASS



PLAIN GLASS

These Two Photographs taken from the Photos in Circular No. 72 mentioned, do not show as marked difference as to light as in the circular.

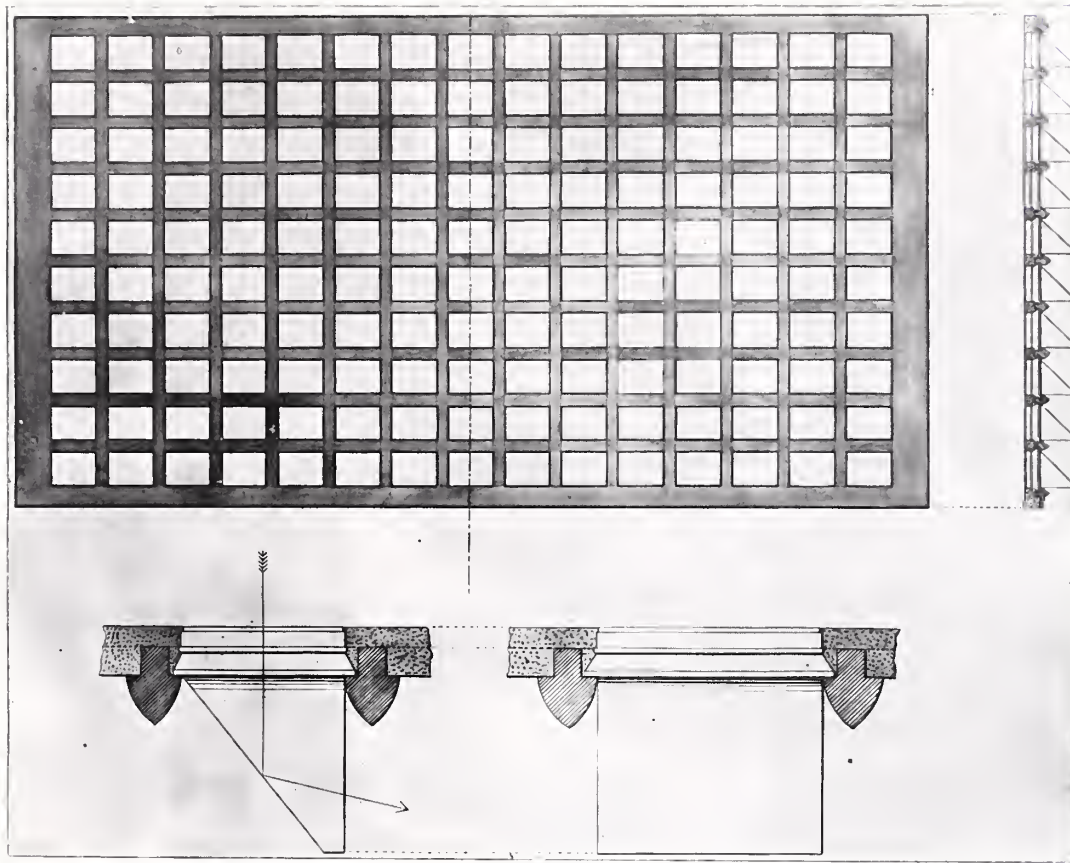
Broadly speaking it was found that in the center of the room was as bright when lighted by a window one square foot of this ribbed glass as with three square feet of plain glass. This was true in all lights from bright sunshine to a heavy thunderstorm, and windows facing in any direction.

In the back office of our place, 228 and 230 First St., this city, is a sash door opening into the back yard, and in it are 8 panels of window glass 12 x 17 inches, 4 of the glasses were taken out and substituted 4 of these corrugated Ribbed Factory Glass which costs eleven cents per square foot, and have two separate window shades to cover and uncover each the factory and plain glass.

Directly opposite this is an open door to a dark room which intervenes between the back office and the front show room, and when all shades are drawn down then the shade over the 4 plain glass is raised the light is feeble on the back wall of the dark room about 22 feet distant from the glass door, but when this shade closes out this light and the one over the factory glass is raised the light is bright on the wall.

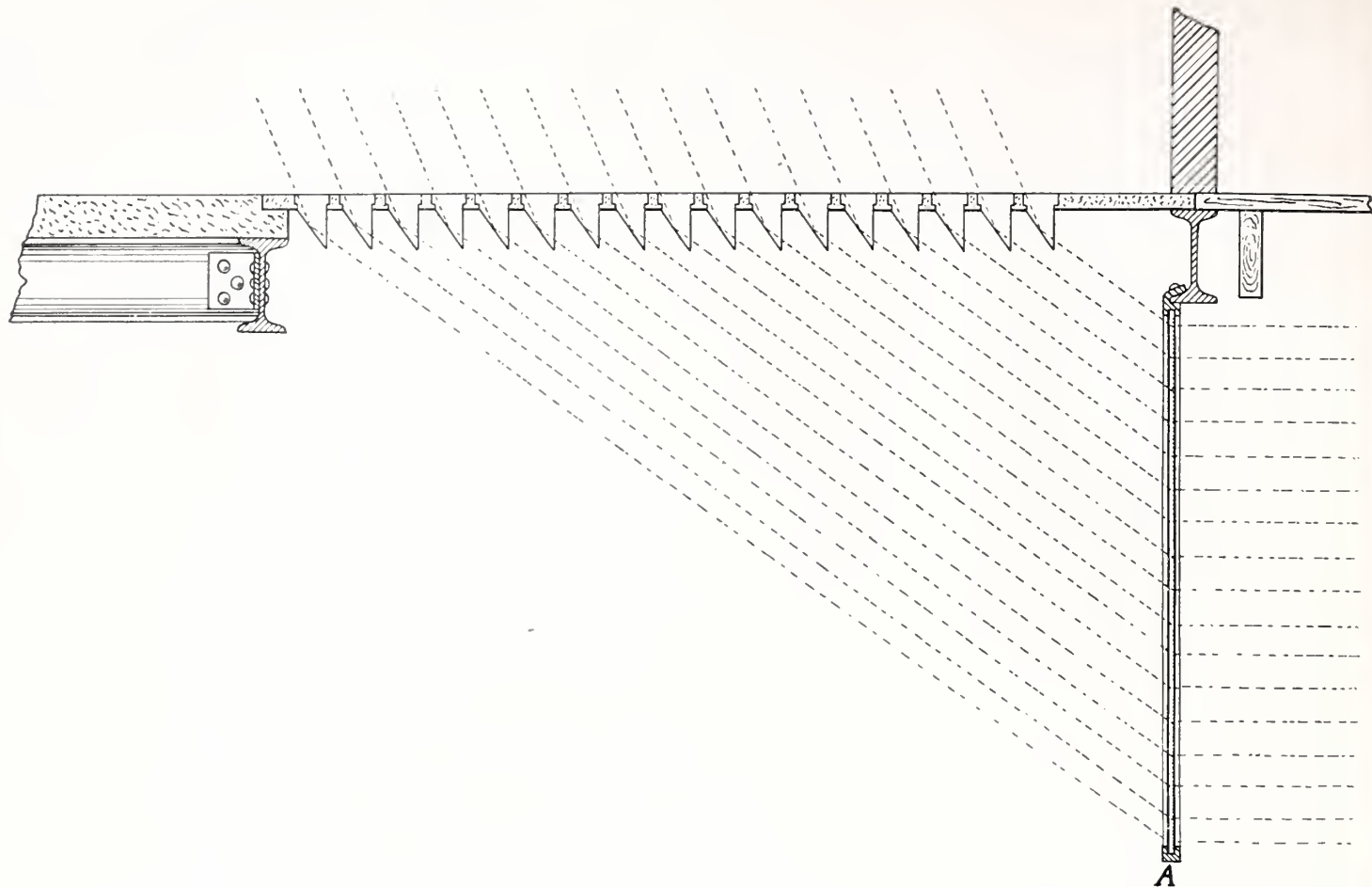
The contrast is surprising and should be witnessed by every architect in San Francisco.

The value of this discovery is very important as we have at hand a cheap reflecting glass which should be generally used in upper sashes, as illustrated on proceeding page and other places where it is desired to project light into dark interiors, and can easily be kept clean as the ribbed portion is on the inside and not exposed to damp fogs and dust common to that of other much more expensive kinds that are suspended outside the window.



The Following Illustrates the Best Method of Introducing Daylight into Dark Underground Rooms

The cut on top of this sheet represents the top surface of a panel of our improved sidewalk lights, that at the right is a cross section of same, and the two cuts beneath represent the front and side (enlarged views) of one of our Mammoth Reflecting Prisms used in said light panel.



This cut is an enlarged cross section of the before-mentioned light panel, with the outer end resting over the outer Steel Header Beam which supports the sidewalk, and the inner end of panel resting on a steel beam on line of front of building, with a suspended apron of ribbed reflecting glass in frame (A) for transmitting back the mass of directed light received on it from the Mammoth Reflecting Prisms.

Our Mammoth Prisms have no equal for reflecting light, are set in heavy metal frame bottoms, and cemented with Portland Cement, forming the top surface of glass with artificial stone between, and the aprons of glass we use are superior for transmission of light to any known, and are verified as follows

These Mammoth Prisms will light a room back 50 or more feet, and to light back an increased distance aprons (A) are suspended in frames between the front basement columns. The apron is filled with ribbed sheet glass 21 ribs to the inch, inverse and obverse, and as stated by Prof. C. L. Norton of the Massachusetts Institute of Technology of Boston in his report of many trials made, *is superior for dispersion of light to any other known form of glass*, superior to prism glass, see the article headed diffusion of light through windows page 8 of this series.

We will furnish these aprons at 30 cents per square foot, while the price here of the best of the several Eastern makes for an inferior article, is \$1.75 per square foot, or nearly six times greater.

Architects and others are requested to examine the increased reflected light in basement from our Mammoth Reflecting Prisms in the sidewalk light in contrast with the Chicago Luxfer Prism Light, both the same size panels, at Hastings Clothing Store, S. W. corner Montgomery and Sutter Streets this city.

The introduction of a flood of daylight into the dark parts of our basements under stores where property is valuable means money, and an increase of cost for that purpose is a wise expenditure. We have right here at hand the means for better diffusion of daylight in basements that can be obtained elsewhere at less cost.

From "Building Review" of San Francisco, Cal., January 26th, 1899.

GIANT REFLECTING LENSES

Do you want to see Mammoth Light Reflecting Lenses made by a San Francisco firm, and placed in position by workmen who live here? Then just go down to the corner of Montgomery and Sutter Streets at the Hastings Clothing Store. On the Sutter Street side you will see a specimen of the Luxfer Prism Co., made in another State.

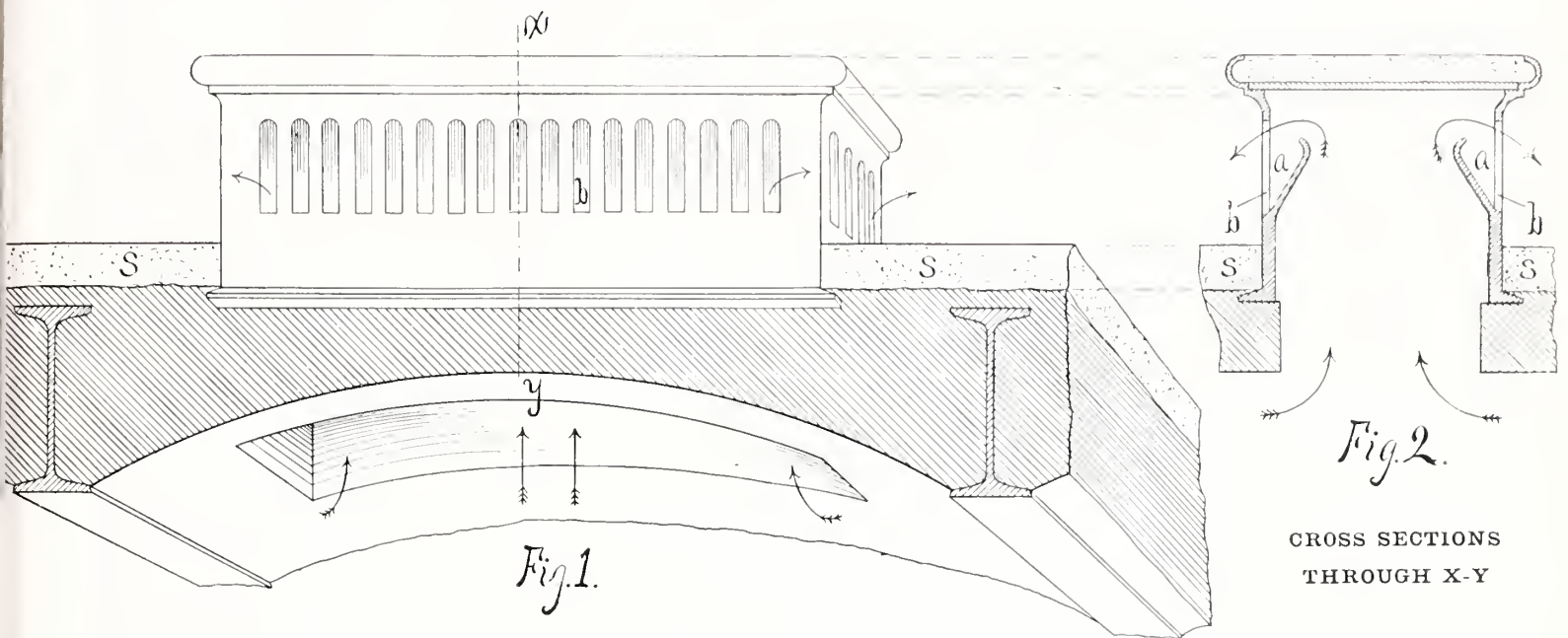
On the Montgomery Street side you will see Jackson's Home Product Mammoth Reflecting Lenses. True, there is a comparison, a poodle can be compared to a lion; but, as for the reflecting power of the lenses, the home product is far and away ahead of the Eastern article. And the great superiority is manifest even to the casual observer. Just go in the store and ask to be shown down stairs, an escort will be promptly furnished you, and you can at once see the difference.

Then, if San Francisco manufacturers beat those of any other city in the U. S. why not specify them and see that they are used, and thus have the money circulated amongst our own workmen and storekeepers. The Mammoth Reflecting Lenses are made by

P. H. JACKSON & CO., 228 & 230 First St., San Francisco, Cal.

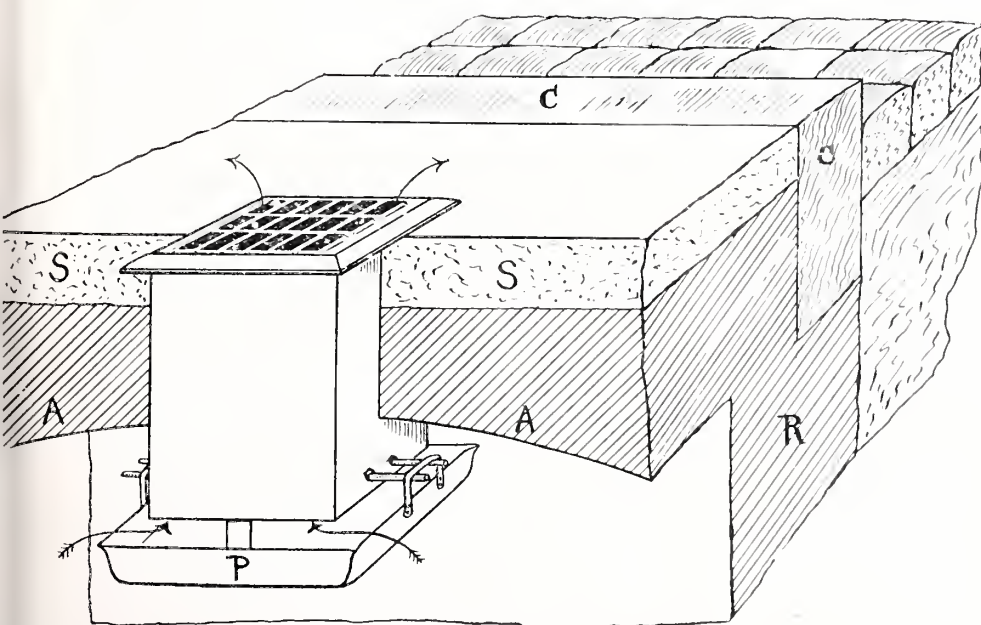
JACKSON'S METHODS OF VENTILATING BASEMENT

EXTENSIONS, OR SPACES UNDER SIDEWALKS



Ventilating carriage block or step to largely ventilate the space under sidewalk. It sets about eleven inches above surface of sidewalk resting on the arch. Length 3 ft. 2 inches. Width 1 ft. 6 inches. Fig. 2 is cross section through x-y, Fig. 1. S, indicates sidewalk. The arrows indicate the air escaping from below passing out through the apertures b. Rain cannot beat in from the outside. This excels any other basement ventilator for volume of exit of air. It is adapted to combined sidewalk and roof of vault construction. It sets just inside the curbstone where carriage blocks are commonly placed. *Glass Lens are inserted in top if so ordered.*

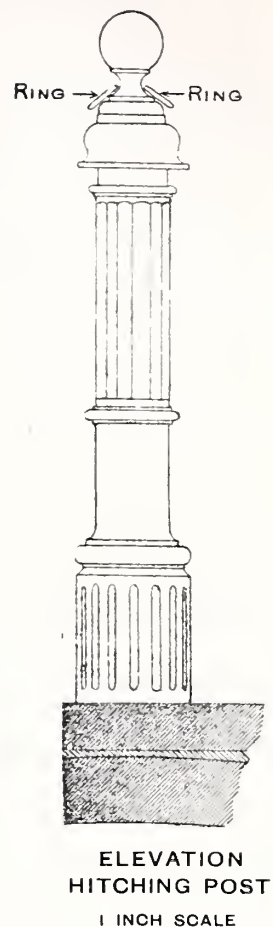
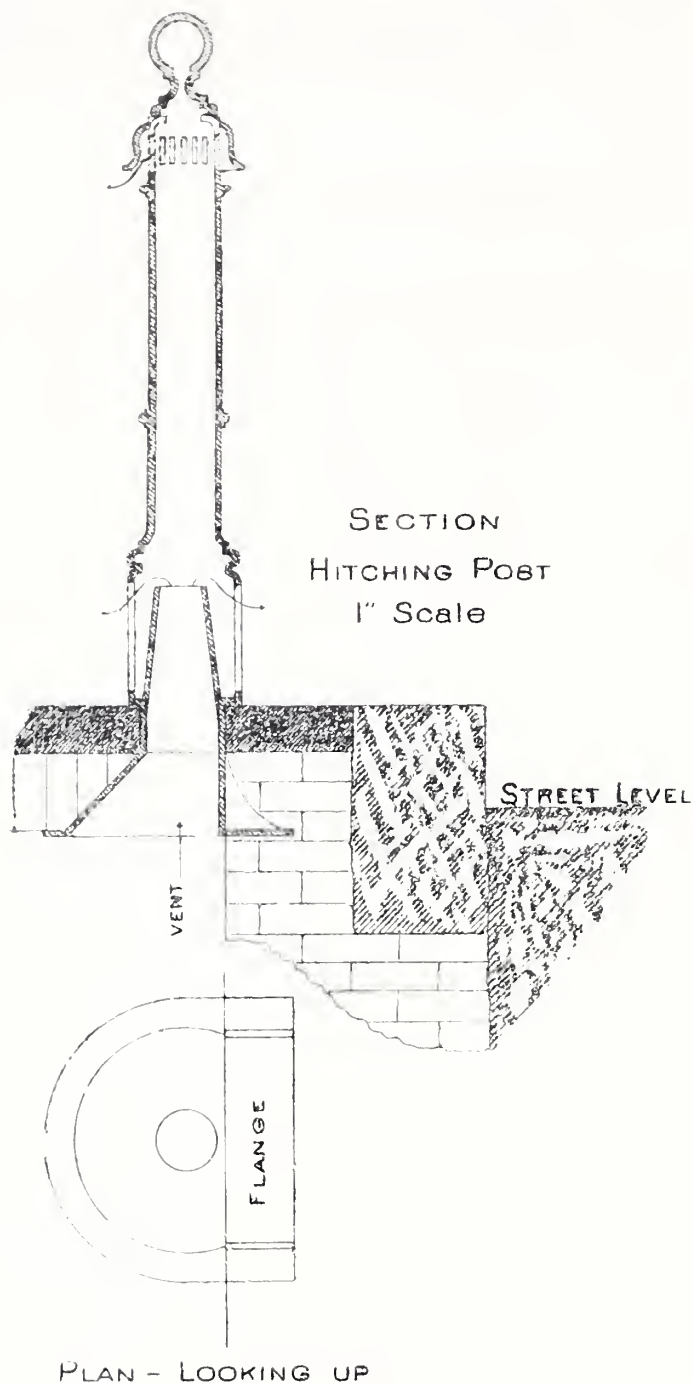
TUBE VENTILATOR



with an enameled dripping pan beneath that does not rust which is removable when filled by drawing out the rods. The arrows indicate the air passing up through and out. C, is the curbstone. R, retaining wall. S, sidewalk. The piece "P," prevents the pan tipping when full.

These are largely used in San Francisco, Cal.

Sizes 14, 10 and 8 inches, if with galvanized dripping pans larger sizes.



VENTILATING HITCHING POSTS BUILT IN THE ARCH AND SIDEWALK NEAR THE CURBSTONE.

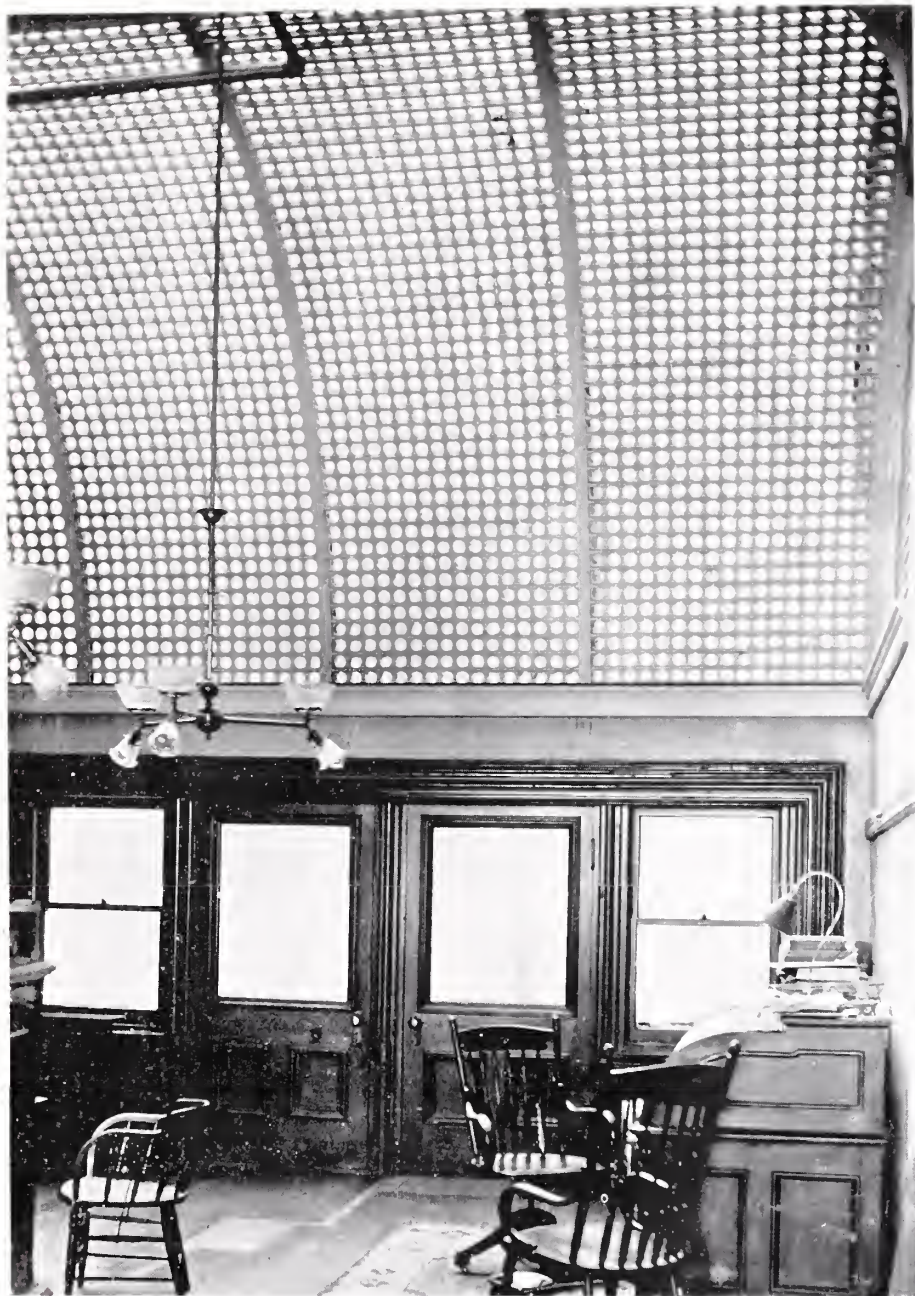
The figure on the left illustrates the cross section of its length. The air from Basement passes up through the bottom and out as indicated by the arrows shown in section. It is adapted to combined sidewalk and steel roof of vault construction and rests on and is secured to brackets built in the retaining wall.

In Chinatown, San Francisco they are used in some cases as chimneys, a stovepipe entering the bottom. They are largely used in San Francisco.

Jackson's Steel Water-Proof Sidewalk Doors and steel frame with drain pipe extending through outer wall. The only efficient waterproof construction made.

The surrounding gutter of steel is never broken from boxes, etc., striking it in passing through, remedying the fault common to brittle cast iron.

The California Safe Deposit and Trust Co's Building, corner California and Montgomery Streets, San Francisco, Cal., was erected early in the seventies, and was extensively altered and improved in 1897 by Henry A. Schulze, Esq., Architect. The following views were taken from photographs of some part of the alterations performed by the undersigned.

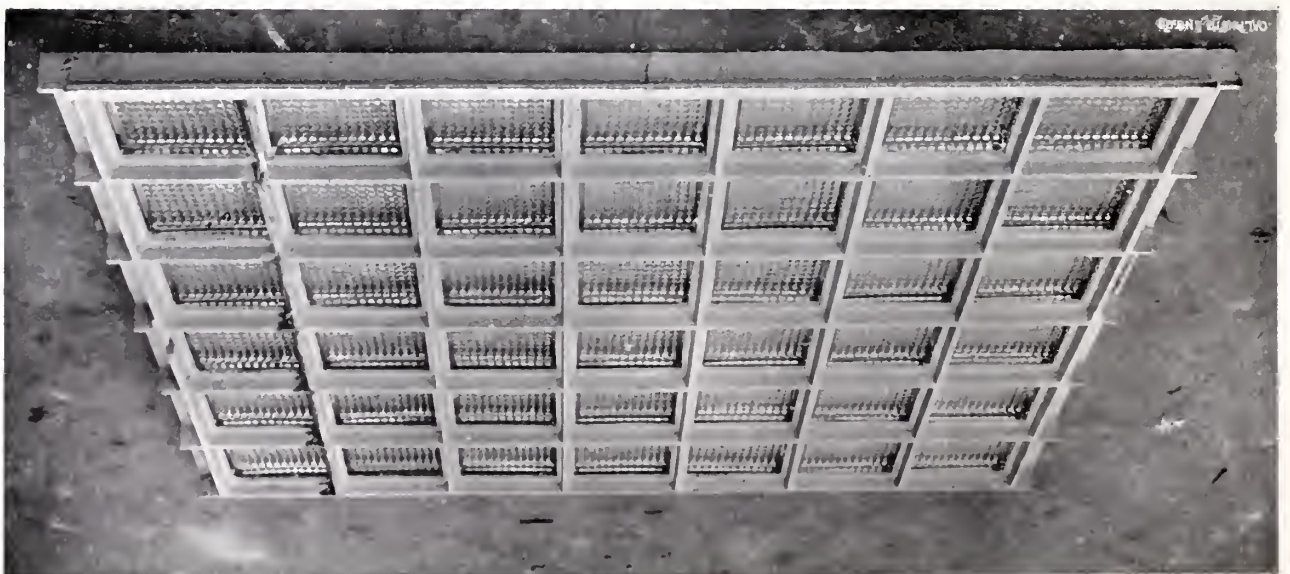


Rear of 1st story of the California Safe Deposit and Trust Co's Building, San Francisco, Cal., showing Jackson's Galvanized Steel and Stone Arched Skylight which extends over the rears of first stories on both California and Montgomery Streets.



The California Street side, (the Montgomery Street side being the same) of the California Safe Deposit and Trust Co's Building, San Francisco, Cal., showing the illuminating sidewalk and area covering with ventilators, which light and ventilate the basement extension beneath and basement of the building.

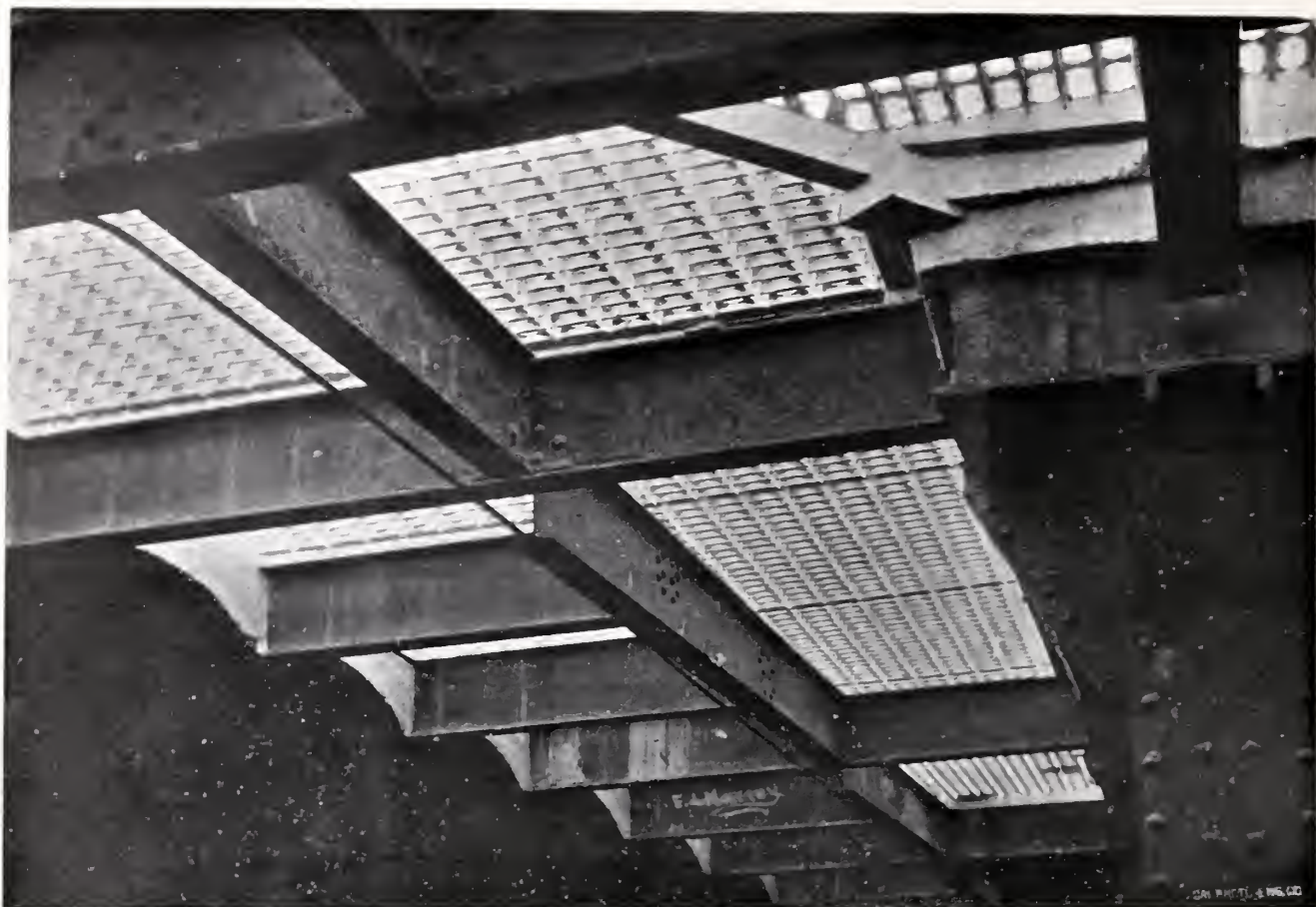
With valuable improved business property there is no part of the building that pays so great a profit on the expenditure as to well light and ventilate the basement extension or space under the sidewalk, and to have the work well executed in every respect.



Under surface of either our floor or roof light, glazed with 6 in. x 6 in. heavy poker-dot glass plates in cast-iron frames.



Under the sidewalk lights. The illustration preceding this showed the top surface of sidewalk lights of the California Safe Deposit and Trust Co's Building; this shows the illuminating ceiling beneath. The small rooms shown are the accounting rooms of their patrons.

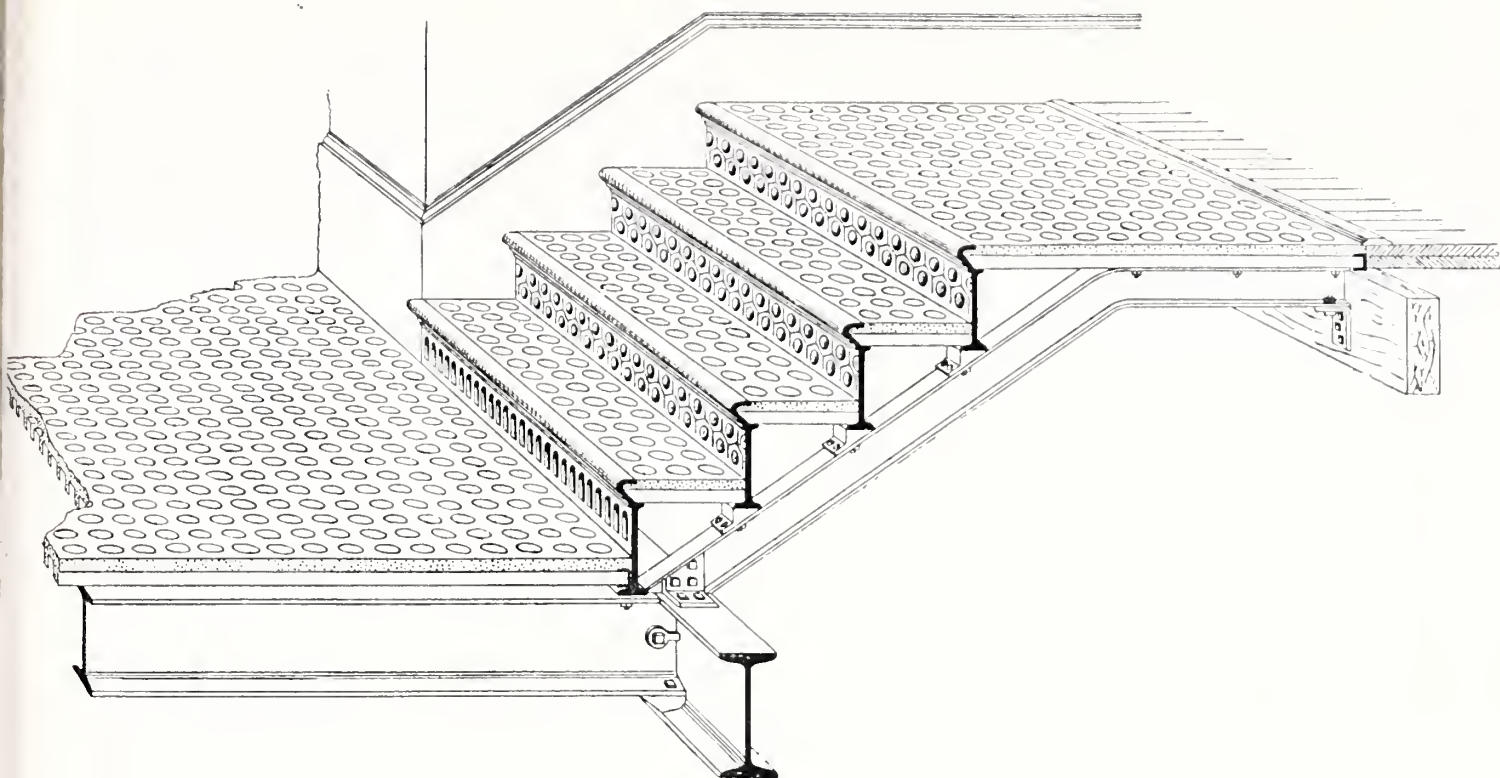


Basement extension or space under sidewalk of the then unfinished Claus Spreckels 18-story building, corner Market and Third Streets, San Francisco, Cal., Messrs. Reid Bros., Architects. From a photograph taken from daylight through the sidewalk lights, showing Jackson's Galvanized Steel and Stone Sidewalk Lights having $2\frac{1}{2}$ inch diameter round reflecting lenses alternating with plano convex lenses.

The basement and basement extension is the press-room of the *San Francisco Call* lighted by the sidewalk lights.



Under surface of one of our floors or roof lights, glazed with $10\frac{1}{2}$ inch square thick, richly ornamented glass plates. Also used for arch and flat skylights. Enlarged view of a glass further on.



Jackson's Improved Illuminating Stoop with beam risers, the risers are of beam strength with nosing cast on as shown, or the nosing may be formed on the tread, the former preferred.

These beam risers are made 12 feet or longer between bearers, instead of having bearers every few feet, increasing the cost and obstructing light.

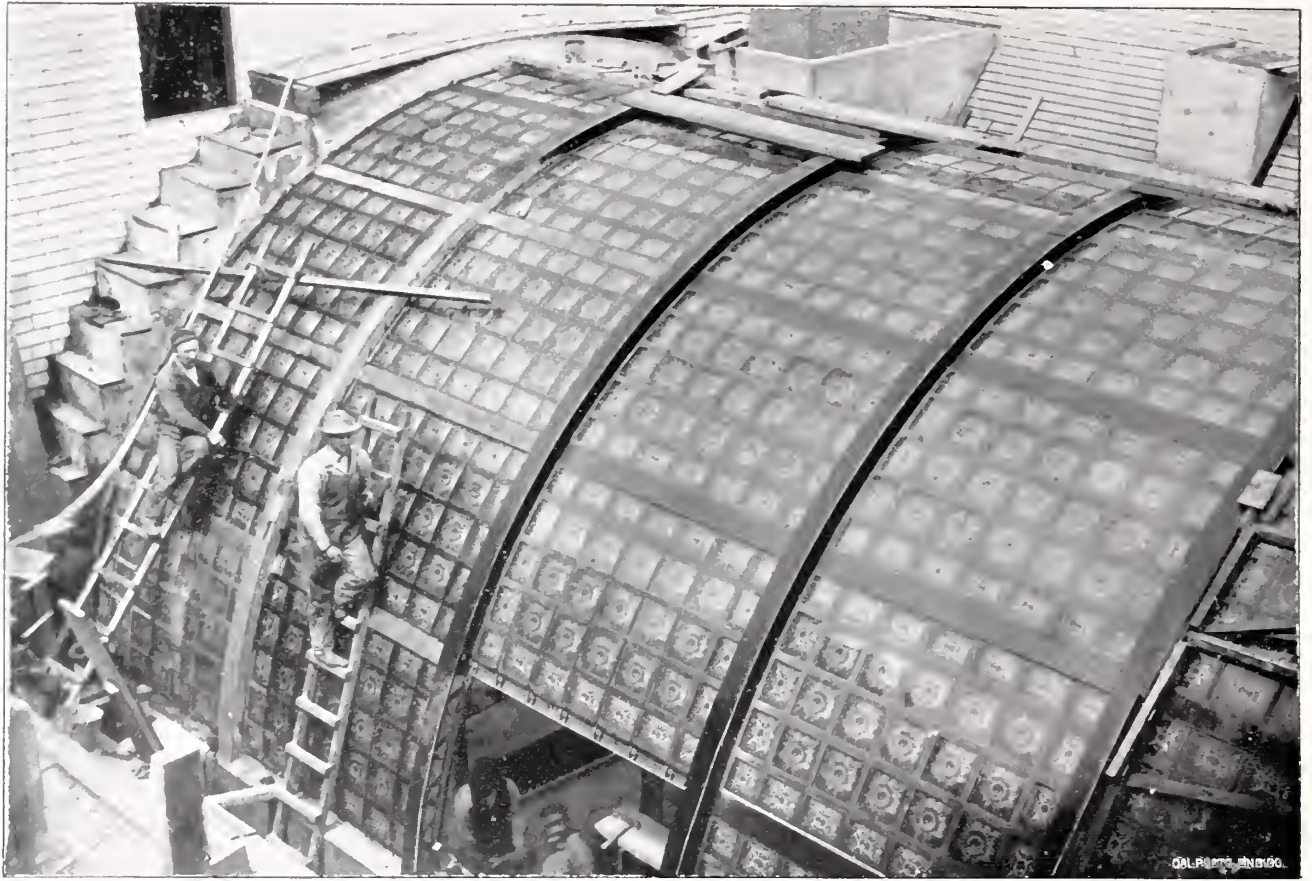
The strength of the beam riser is computed by Hodgkinson's formula for cast iron beams. The treads, platform, and sidewalk as shown are galvanized steel and stone sidewalk lights. The metal bottoms do not rust and discolor the paint.

Iron stairs plain or inlaid of this construction.

Daylight and ventilation is indispensable to finished basements of valuable business property.



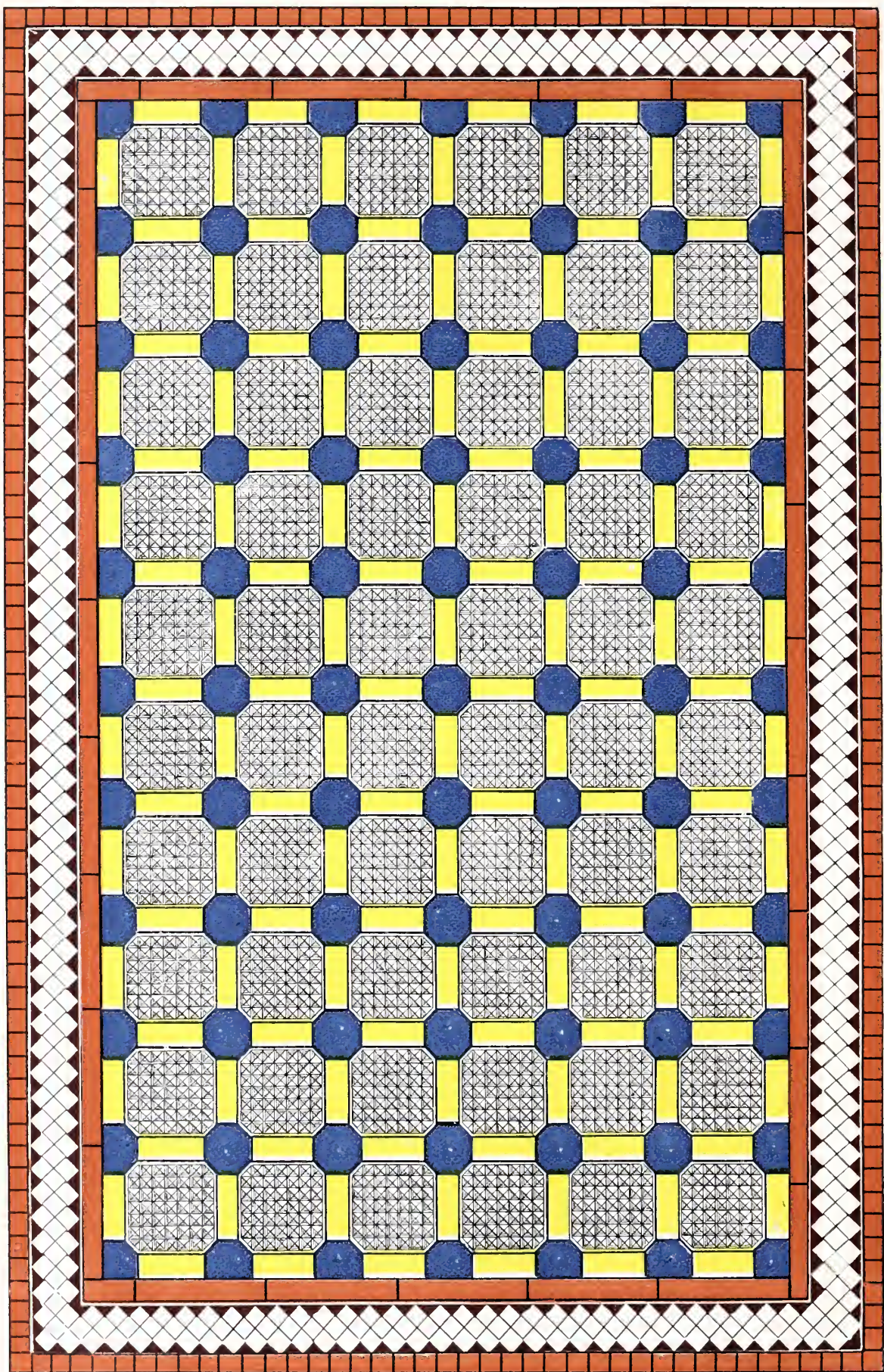
Cement or stone illuminating vault covers and rims. The cover made to lift out or stationary, as ordered. Sizes, diameter of cover, 18, 24, 30 and 36 inches.



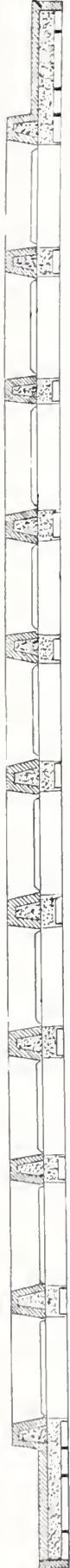
Exterior view of a large *Arched Sky Light* 35 feet across, unfinished; showing our workmen inserting in the iron frames the $1\frac{1}{2}$ inch thick, ornamented glass plates $10\frac{1}{2}$ inches square. An enlarged view of the glass plates which the men are setting shown below. The glass at the left shows the flat top surface, and that at the right is the bottom or inside ornamental surface. These ornamental glass plates are also made up into iron floor lights, and flat roof lights.



ILLUMINATING TILES COMPOSED OF 5-INCH DIAMOND OCTAGON GLASS LENSES, WITH COLORED ENCAUSTIC TILE FILLING AND BORDER, FOR VESTIBULES AND FLOOR LIGHTS.

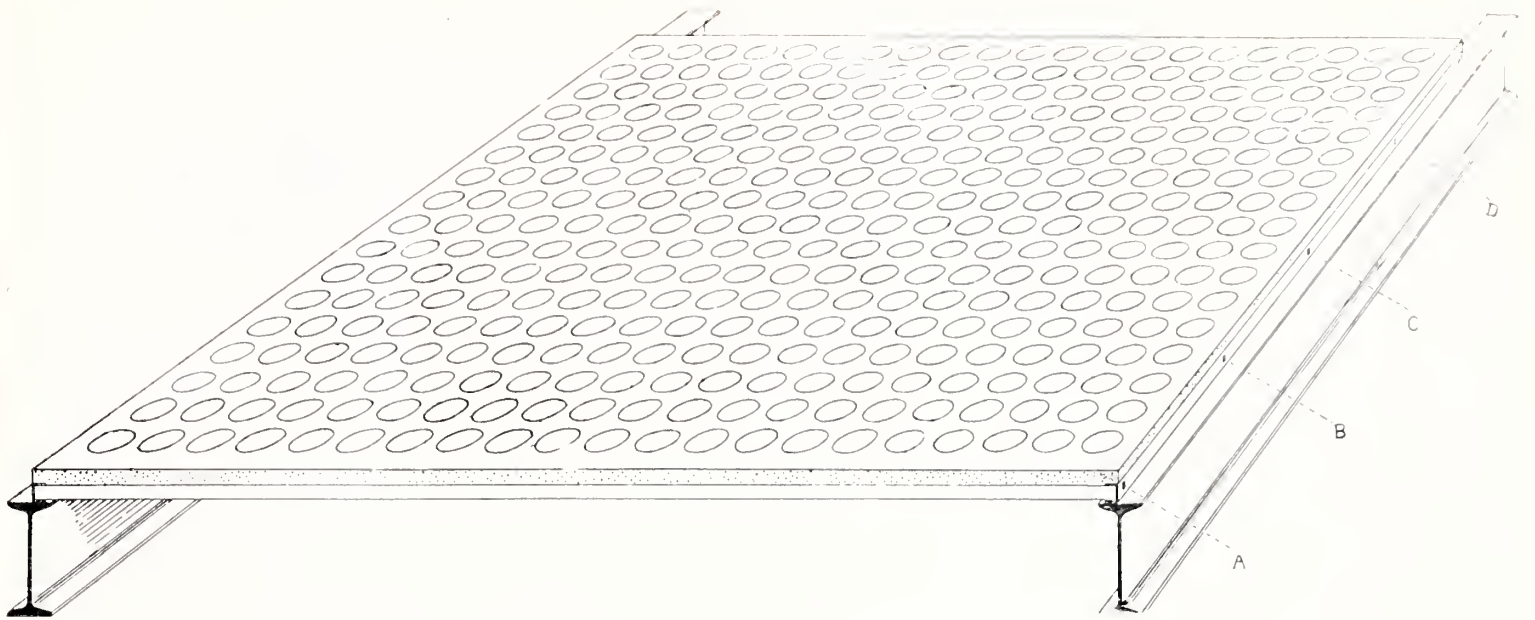


Face View of the Tile complete, with Lenses and Tiling inserted. Used for Vestibules, Court Yards and Floors.



SECTION

P. H. JACKSON & CO.,
228 & 230 FIRST STREET, SAN FRANCISCO, CAL.



The above illustrates a panel of Steel and Stone Sidewalk Lights or Illuminating Slab, extending from beam to beam on which its sides rest. The seam between it and the next panel is usually a quarter of an inch in width over the center of beam. To close the seam against leak the space is to be completely filled with liquid neat Portland Cement forced down by a table-knife blade, the bottom bearing of the tile having been bedded in neat plastic Portland Cement. As they range from $2\frac{1}{4}$ to $2\frac{1}{2}$ inches in thickness, about double the thickness of, cement sidewalk lights with cast iron bottoms, this increased thickness is a preventative from leak by having double the depth of seam.

They are with steel frames and an occasional wrought iron grating bar which holds them together; the bars extending through the corrugations with riveted ends A, B, C, D, E, as shown. We send these strong, large panels to fill orders in different parts of the country, occasionally a panel having an area of forty square feet. They are glazed with $2\frac{1}{2}$ inch diameter by either 1 inch or $1\frac{1}{4}$ inches thick lenses. The metal bottoms are galvanized preventing rust and discoloration of paint.

These large panels light the basements of the Parrott or Emporium Building, Spreckels Building, California Safe Deposit and Trust Company's Building, Claus Spreckels Building, Wells, Fargo & Co's New Building, Hotel St. Nicholas and many others in this City, Los Angeles, Sacramento, San Jose, Portland, Seattle and elsewhere.

TESTIMONIALS

Fire-Proof and Other Qualities of Jackson's Steel and Stone Sidewalk Lights.

Resistance to Intense Heat.

San Francisco, July 10, 1895.

MESSRS. P. H. JACKSON & CO.

GENTLEMEN:—At the great fire in this City on the 27th of last month, thirteen days ago, the Shirley House, S. W. corner Welsh and Fourth Streets, belonging to me, was burned to the ground. So intense was the heat that the two sets of iron fire-proof sidewalk doors were heated and bent out of shape and hung down, and the steel beams that supported the inner ends of your Steel and Stone Sidewalk Lights were warped and deflected, the glass lenses in your lights were melted in the form of globular-shaped pendants and hung below the steel bottoms, while the platforms or body of the lights, excepting from a slight curvature due to the intense heat to which they were subjected, remained unbroken and are now used as a sidewalk and roof covering to the space beneath and people walk over.

From this severe trial, I can recommend your Steel and Stone Sidewalk Lights as great resistants to intense heat, as they stood the intensity of a fiery furnace while iron sidewalk doors did not.

Respectfully yours,

JOHN SHIRLEY.

TESTIMONIALS.—Continued

Resistance to Impact.

In San Jose, Cal., in 1892, a heavy plank about 12 foot long, fell endways from a plasterer's scaffold on a line with the third story of the building, and its end struck one of these Steel and Stone Sidewalk Lights, forming area lights, merely indenting it, due to their thickness and strong ductile steel bottom.

The architects of the building, Messrs. Jacob Lensen and Son, wrote us commending the great strength of the lights, which, had they been the ordinary thin kind with brittle cast iron bottoms, the plank would have undoubtedly gone through to the cellar floor.

Resistance to Cutting Through.

BURGLAR-PROOF.

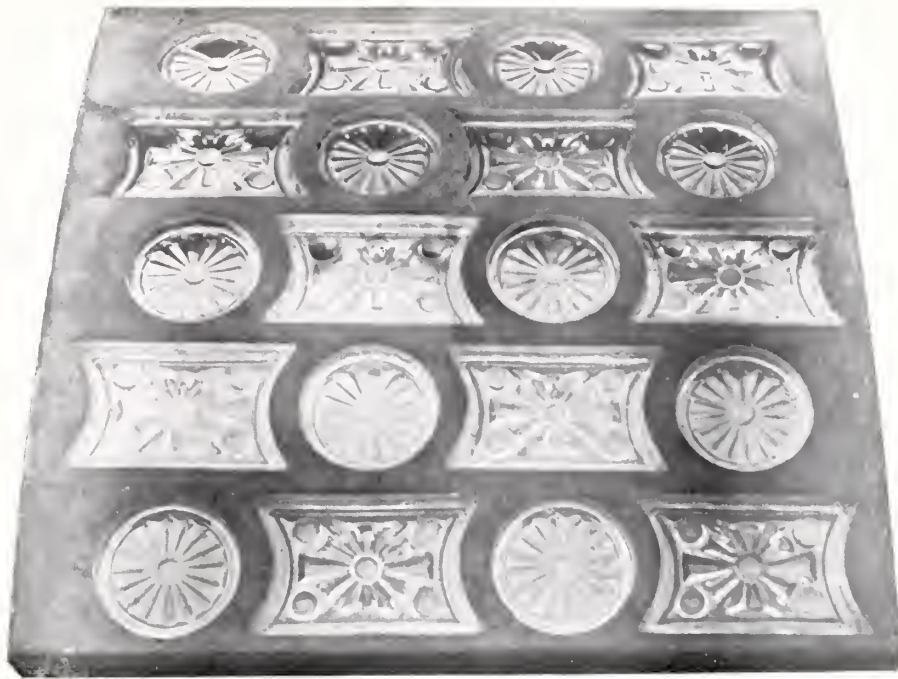
In December, 1893, a fire occurred in the basement of the Florence Block, N. W. corner Ellis and Powell Streets, this City. The frontage on both sides have our Steel and Stone Sidewalk Lights. The firemen attempted to get access to the basement for their hose by cutting through the lights with their axes; they broke out the cement and glass but failed to cut through the tough steel bottoms and had to gain entrance elsewhere.

Resistance to Explosion.

On May 24th, 1894, in the basement of the lithographic establishment of Messrs. Dickman-Jones Co., on Folsom near First Street, this City, the head of a steam heater located about three feet below our Steel and Stone Sidewalk Lights, blew off, lifted the outer ends of lights, blew out many of the lenses and broke the cement or artificial stone, bent upwards the steel bottoms, and broke the sidewalk slabs adjacent to the lights. We bent the steel bottoms back to their original shape and made up the lights and cement work. Had these lights been of half their thickness, like the ordinary kind, and with brittle cast iron bottoms, they would undoubtedly have been blown to pieces and had to be made anew.

Burglar-Proof Qualities.

On Tehama Place, a dark lane on the side of a store facing First Street, in this City in June, 1895, burglars attempted to gain entrance to the basement of the store through our lights, they broke out the cement and glass with heavy weights and pries, but failed to cut through or break the tough steel bottoms.



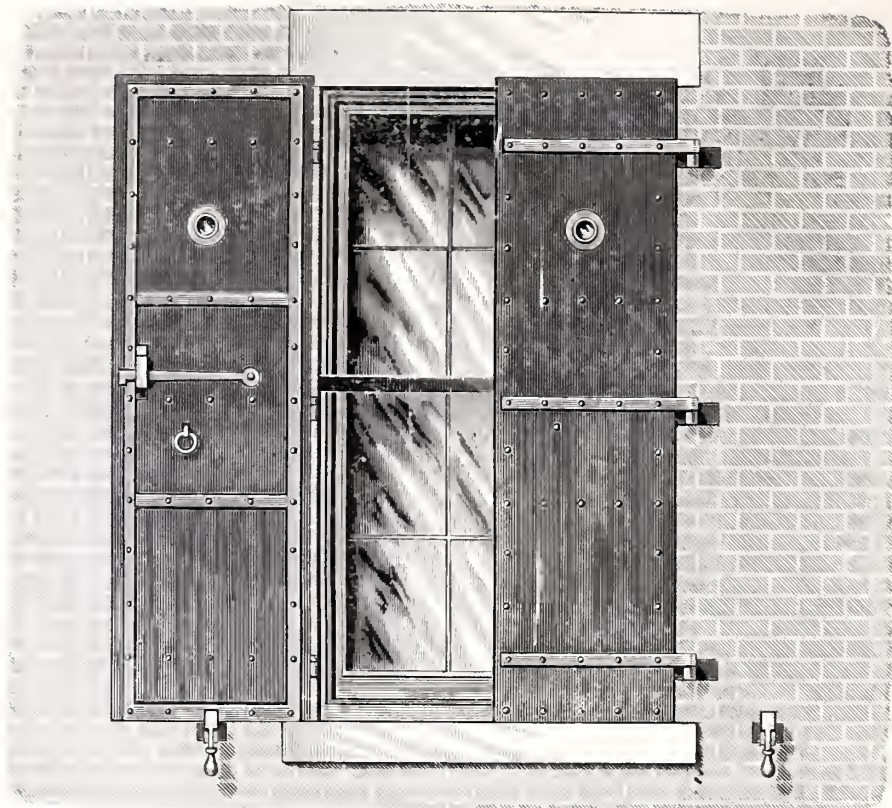
A small panel of steel and stone arched skylight with oblong and sunburst lenses which are also used in floor lights.



A small panel of steel and stone arched skylight with $2\frac{1}{2} \times 1$ inch or $2\frac{1}{2} \times 1\frac{1}{4}$ inch round lenses.



The figure at the left illustrates an iron coal hole cover and rim.
 “ “ “ right “ “ “ “ “ with a few glasses and rim.
 “ “ in the middle “ “ “ illuminating vault cover and rim.
 We have sizes of each kind, diameter of cover, 18, 24, 29 and 36 inches.



P. H. JACKSON & Co.

.....MANUFACTURERS OF.....

Architectural Iron and Steel Work for Buildings

**FIRE-PROOF FLOORS AND CONSTRUCTION, STEEL BEAMS,
COLUMNS, GIRDERS, IRON STAIRS, SHUTTERS,
DOORS, GRATINGS, THE COMMON AND WATER
PROOF SIDEWALK DOORS, FIRE-ESCAPES
AND STAND PIPES, BASEMENT
VENTILATORS, ETC.**

...ACME VENTILATORS...

WITH DOUBLE BLOWING CHAMBERS HAVE DOUBLE THE POWER TO EXHAUST
COMPARED TO BEST VENTILATOR KNOWN

COMPUTATIONS MADE AS TO THE STRENGTH OF ANY IRON OR STEEL BUILDING CONSTRUCTION

228 and 230 FIRST STREET and 5 and 7
TEHAMA ST.

TELEPHONE MAIN 791

BOX 27 BUILDER'S EXCHANGE

.....San Francisco, Cal.

JACKSON'S

Patent Water-Proof Sidewalk Doors

WITH STEEL FRAME

The Only Water-Proof Construction Made. Is Flush with Sidewalk, and as the Gutter is made of Steel, Never Breaks, removing the general complaint of its breaking when made of Brittle Cast Iron.

Fig. 4

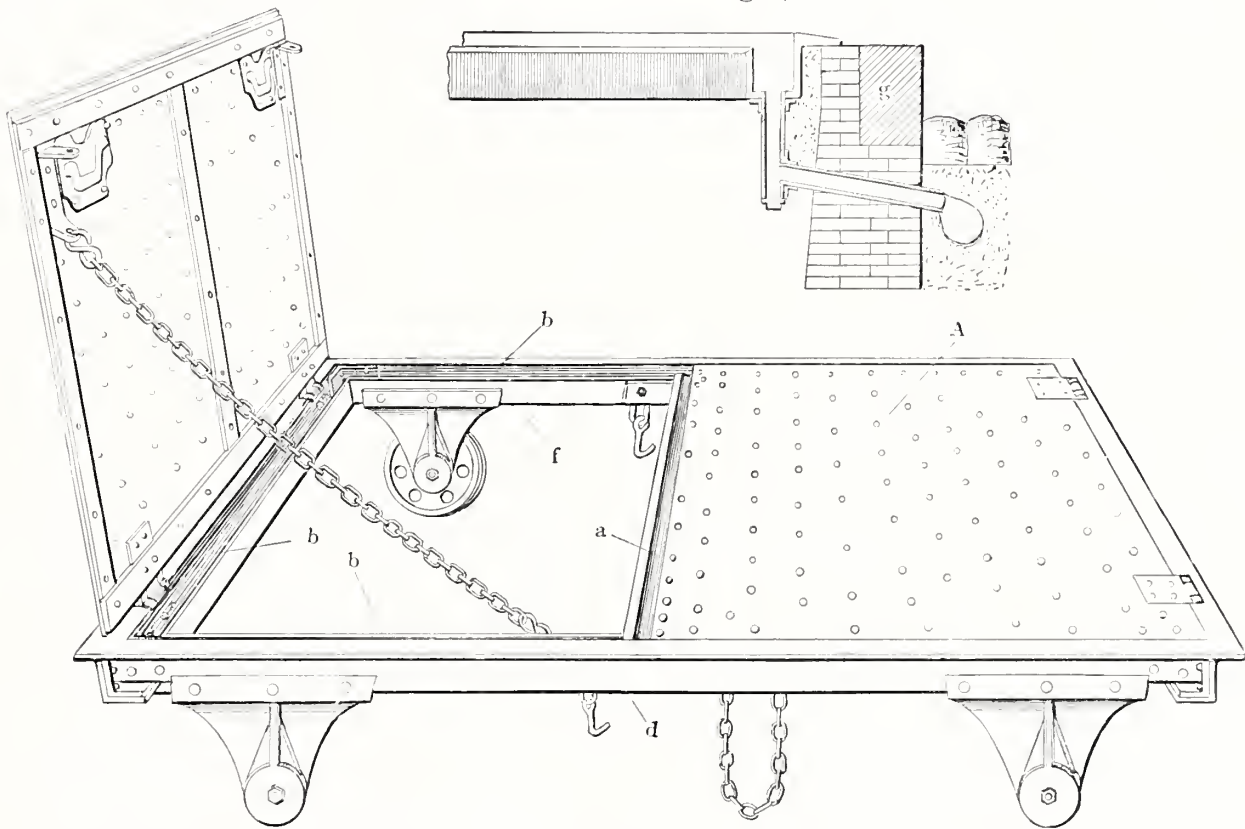
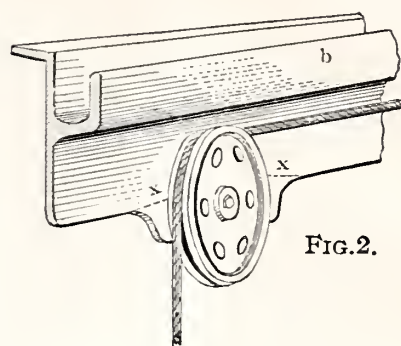
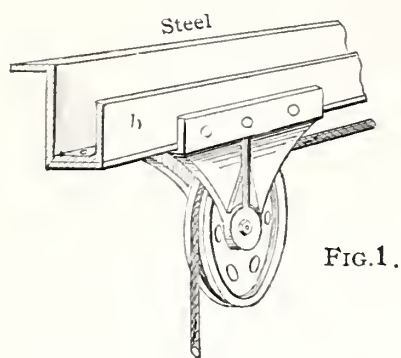


Fig. 3

In Basements of First-Class Buildings that have modern improvements for Light and Ventilation, THERE IS A GENERAL COMPLAINT DUE TO LEAKY SIDEWALK DOORS, the WATER LEAKING AROUND the OUTER EDGES OF AND BETWEEN the DOORS, forming pools on basement floor, WETTING GOODS that may be under them, and making that part of the basement extension DAMP AND THE WALLS MOULDY.

THIS IS ABSOLUTELY THE ONLY WATER-PROOF CONSTRUCTION MADE, THERE ARE SEVERAL HALF-WAY ATTEMPTS that are water-proof against heavy dews, but an abomination during continued hard rains.

Figure 3 on the preceding page is a perspective view showing a set of these water-proof Steel Doors and Steel Frame, showing door (A) closed and the other open; showing the inside surrounding gutter b, and the cross gutter, a, the latter attached to door A, and lifts with it.



The general objection heretofore made to the cast iron surrounding gutter b, see Section, figure 2, *breaking from cases or barrels striking it in passing over, is now overcome by making the frame of Steel, and at no increased cost compared to brittle cast iron.*

This improved frame as now made, consists of Steel Z Bar and Steel Angle riveted together, waterproof and of great strength, better shown in Section, Figure 1, this forms a large inside surrounding gutter, see b, b, b. Figure 3, which receives the water that comes in around the outer edges of the doors, and the water that leaks between the doors falls in the cross gutter a, and runs into the surrounding gutter, b, then all empties down and out the drain pipe which extends through outer retaining wall to under the roadway, see Figure 4; g, is the Curb Stone. At the bottom of the vertical drain pipe, see Figure 4, is a screw plug which may be removed should the pipe possibly get filled with dirt.

Furthermore, the sheaves which carry the steel ropes or sidewalk hoists or hand elevators are attached to all cast iron frames of sidewalk doors in the manner shown in Figure 2, the sheave is held on one side of a single thickness of cast iron, into which the pin is inserted, and when the loaded platform of hoist is carelessly let run and then checked, produces enormous cross or bending strain from leverage of the sheave on one side of the single thickness of cast iron, and they sometimes break from such severe usage on dotted line XX, Figure 2. Such was the case at 830-840 Market Street, this city, the owner had both new sidewalk hoists taken out from breaking of the cast iron frames at this place and substituted hydraulic elevators that do not depend on the frame.

To obviate this cross strain, the hangers for sheaves on our steel frames are made as shown in Figure 1, the strain is down in a direct line and with a double thickness of metal, one on each side of sheave, and do not break.

Abstract, absolutely water-proof and do not break, consequently no cause for damage from injury.



